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NATURE NOTES,

THE SELBORNE SOCIETY'S MAGAZINE

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EDITED BY

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HE PRAYETH BEST WHO LOVETH BEST
ALL THINGS BOTH GREAT AND SMALL;
FOR THE DEAR GOD WHO LOVETH US,
HE MADE AND LOVETH ALL.

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EDITORIAL.

WHILE beginning our tenth volume we may, we hope, judging from the letters we receive and the comments of our contemporaries, congratulate ourselves on the continued interest of the magazine. Our chief embarrassment, indeed, has been the limited space at our command, which has compelled us to delay the issue of many excellent articles. What is, after all, of more importance than our success as a magazine, is the advance of the cause of humanity and the love of nature; and this too, thanks in a great measure to the efforts of the many agencies working in sympathy with us, such as the National Trust, the Humanitarian League, the R.S.P.C.A., the Society for the Protection of Birds, and the Commons Preservation Society, we may confidently assert to have been furthered. The formation of a Parliamentary Committee for joint action has been a great gain, and we shall hope to see many more occasions for our concerted co-operation in such matters, the Spurious Sports Bill, for instance. If we could only persuade people that a horse's tail when docked is ugly, that "ospreys" are vulgar, and that cruelty generally is as degrading a vice as drunkenness, we should certainly have done more than anything accomplished during 1898. Meanwhile it is humiliating and discouraging to find the Selborne Society prevented from doing its proper share in this work merely by lack of funds.

SELBORNIANA.

Docking Horses is now carried on to a painful and even shocking extent, and any one who has much to do with riding or driving horses cannot but see how the animals suffer from the flies when they are deprived of their natural weapon of defence against the insect pests. On the other hand, absolutely long natural tails are unworkable. Last month the Royal Agricultural Society passed a resolution that after the Maidstone meeting of next year no foals with docked tails shall be exhibited; after the meeting of 1900 no yearlings, and after the first meeting of the new century no two-year-olds. And most people regarded this as a step forward in humanity, as well as in cultivating the graces of horseflesh. But a number of societies have protested, and an attempt at a compromise was made at the Royal Agricultural Society's meeting yesterday, when Sir Walter Gilbey moved that the resolution should apply to hunters only. Mr. Muntz moved, virtually, that the operation of the resolution of November should be suspended, and we regret to say this was carried by twenty-six votes to twenty-two. Thus, the whole question of docking is re-opened, and considering the cruelty both of the operation and of its effects, we hope the country will make its mind felt on the subject. To shorten the tail is bad enough; to truncate that which is a portion of the animal's body is monstrous.—*Daily Chronicle*, December 7.

M. Bourdarie's Appeal for the Elephant.—Mrs. Hubbard writes:—"A practical method of discouraging the trade in ivory would be efficacious if it were only adopted generally. It is simply that we should all forego the use of ivory, and have our knife-handles, &c., made of xylonite, or one of the good forms of celluloid. The 40,000 elephants annually destroyed for manufacturing purposes have their long, wise lives sacrificed mainly in the service of billiard players. This is quite unnecessary, as xylonite billiard balls are now made as truly and are as pleasant to play with as those of ivory."

Pasteur Institute for India.—Captain F. E. Pirkis sends us a memorial from a public meeting of native residents in Bombay to the Governor-general in Council against the proposed "Indian Princes' Victoria Health Institute."

An Old-World Botanist.—*Erratum.* On p. 225 in vol. ix., line 11, for "Bobart's" read "Dodart's."

THE SUMMIT OF SNOWDON.

THE most prosaic and commonplace person must feel that there is something awful and sacred about the highest point of a great mountain. The topmost crag of Snowdon, the loftiest point in England or Wales, reigning over so magnificent a prospect, so beautiful in its natural form, and crowning so mighty a king among mountains, must, one would have thought, have commanded the veneration of the English people, and been carefully guarded against all injury or defilement. It belongs to three rich land-owners, and it would have been perfectly easy for them to have proved themselves fit guardians of such a spot, simply by refusing to allow any harm to be done to the natural outline of the crag, and by insisting on the removal of the horrible mass of litter and refuse which is now making the spot into an ash-heap. The owners have however, apparently, cared for it only as something out of which to make money. They have allowed two hideous corrugated iron shanties called "The Hotel" to be erected at the very summit, so that the form of the crag is quite distorted as seen from all sides, and from almost any distance. A straight artificial terrace emphasises the unnatural line of the "Hotel," and a brick wall (without any other use or object, except, I was told, the maintaining of some one's "rights") has been carried for some yards along the edge of the crag. Bricks, corrugated iron, and straight lines on the very summit of Snowdon! Can one imagine that any civilised owner of such a spot would tolerate so gross an outrage? But this is perhaps not the worst. The accumulated rubbish of years is scattered everywhere: all the ashes, vegetable and other refuse from "The Hotel" are merely thrown out upon the mountain-side: at the very door of the hotel lay (when I was there) an unsightly heap of broken boxes, jammy papers, and so on: one could not move without being aware of the peculiarly offensive form of litter caused by trippers.

Now is all this inevitable in a place visited daily, in the season, by hundreds of people? I protest strongly that it is *not*. A new member of the Selborne Society, who called my attention to the subject a few weeks ago, suggested that the railway (which of course brings so many more people, and has done so much to vulgarise the mountain) would now make it perfectly easy to remove daily all the refuse and litter in bins, provided by the "Railway and Hotel Company" for that purpose. He felt so deeply that it did not help one to enjoy the dawn to find that one was standing on an ash-heap that he offered to share the initial expense of clearing Snowdon if the Railway and Hotel Company could be induced to insist on the manager of the Hotel keeping it clear.

As a proof of how easily this can be done, I may describe a small piece of similar work successfully carried out by the Barmouth Branch of the Selborne Society. The well-known Panorama Hill was, three years ago, in as unsightly a condition as are, alas! most of our show places. Our little Society rented the hill from the Urban District Council: our President, at considerable expense, repaired the refreshment shed at the entrance and removed all the rubbish; and it is now sub-let to a tenant on the strict condition that the scattered papers, broken bottles, &c., shall be removed *every* day. The result is excellent. Now and then, following close upon a picnic party, one finds fragments scattered over the heather; and the tenant of the shed complains bitterly that people, "even artists," seem to climb to the highest point for the express purpose of tearing up and scattering their letters. But I have certainly never seen a show place free to the British public so little disfigured by litter. The same method could easily be enforced on the top of Snowdon. The managers of the hotel might be obliged to collect in a bin, and send down by the first train each day, all the ashes, refuse and litter: the bin would come up again empty; and this done regularly would effectually prevent the top of Snowdon from becoming what it will soon be unless something is done—one gigantic ash-heap. To inaugurate such a system will cost something: will anyone help in doing this, which is, I think, the least that ought to be done? My ideal scheme would be to buy the top of Snowdon by public subscription, and put it in the hands of the "National Trust," as the possession of the nation for ever: then to have the corrugated iron hotel, the terrace and the brick wall entirely removed, as well as all the accumulated rubbish, and the top-most crag left to recover its natural form as far as possible after such abuse. A neat *low* stone hotel should then be built, 100 feet at least below the summit, so that its outlines would not anywhere interfere with the outlines of the mountain, and the manager be bound over, as I have said, to keep the place absolutely free of litter. Is this an impossible ideal? Is it true that we can make tunnels under seas, and carry railways up mountain sides—but cannot save from disfigurement the finest mountain in our land?

BLANCHE ATKINSON.

A PET TROUTERY.

WHEN living in Hampshire a few years ago I had unusual facilities for observing the ways and habits of trout. They became a great delight to me, and many an hour did I spend in the company of my darling fish, which I soon looked upon as entertaining and instructive pets.

A hundred yards above my garden there bubbled up, amid the sand and flints in a shallow hole, a glorious spring of the purest and clearest water imaginable. It was fed by the rain that had fallen on the Southdown Hills, and had been filtered through hundreds of feet of chalk. The stream from this spring ran along the side of the village road and past my lawn, emptying itself into an arm of the sea barely a quarter of a mile below. In the top corner of the lawn there was a small sluice gate, which admitted a sufficient flow of water to supply the moats that separated the garden from the adjoining field. This sluice had to be carefully guarded for fear any fish should get out of bounds and into danger. The most efficient barrier proved to be a stout iron grating, which had often to be cleared, or it became choked and obstructed the free entrance of the water. An ordinary piece of boarding across the sluice was found to be decidedly dangerous, as the fish would leap it when the outside stream became a little fuller than usual. The stream through the upper part of the lawn was about six feet wide and some thirty-five yards long; its sides were bricked—as indeed was all my water—to about eighteen inches above the water's edge. A small culvert (across which was a delightful summer-house), joined this stream to the central moat, and here my show fish were kept. This moat was thirty yards long and five feet deep, and was connected by a small waterfall with another moat at the side of the kitchen garden. This was a much larger and deeper piece of water, having trees along one side of it, whose branches, stretching over the water, assisted not a little in providing food, as most trees do, in the shape of flies, caterpillars, and suchlike fish delights.

In a little paradise like this it was no easy matter to keep up a stock of large trout, for I lost them in various ways. If the grating were by chance removed, even but for a short time, one or two of the fish would take an excursion into the stream outside, whence, if they did not come to grief, I had great difficulty in persuading them to return. One night, during violent rain, the grating became choked, and the water poured in volumes over the top. Next morning several of my best fish were gone, for they had leaped their bars. Then I am afraid the village lads used now and then to practise their sportive turn of mind on my pets, by taking a mean advantage of me, and fishing for them at peep o' day, when I was safe in bed. This I always found out, even if I did not

catch the culprits, both by missing some of my fish and finding every one in the moat in an unwonted state of timidity and restlessness. After spawning, too, they often died. Some, too, used to lose their lives by jumping on to the grass. To prevent this I put up a railing with wire netting close to the water's edge.

And here let me say that my experience clashes with the common notion that fish instinctively find their way back again into the water, if by any chance they leave it. In almost all streams the banks slope down to the water's edge, and should a fish become stranded, a few flops take him back to his native element by ordinary gravitation. Several of my trout, however, have been found dead on the level turf within a foot or two of the water's edge. Here, indeed, was a fair chance for instinct to come to the rescue; but it often did not come. With, then, these fruitful sources of loss, the problem was how to replenish the stock in water where its occupants allowed no fish of their own, or almost any other kind, to live under a quarter of a pound weight; for it is no easy matter to obtain large live trout unless one pays through the nose for them. It was solved by letting down the water in the upper moat, and getting all the fish into the moat below the waterfall. I then cast about for a fresh supply, and was given the contents of a tiny pond in a garden with a fountain in the middle. After great trouble I secured two dozen fish; but oh! such fish. They were about six inches long, and in such sorry plight that I never set my eyes on the like before. They were almost starved "to death," more lanky in the side than any spent herring, and so weak that I feared they could never be got home alive. My ten miles' drive was taken up in pumping air with a pair of bellows into the two cans in which the fish were placed. A local stream produced a couple of dozen more, and I was well set up.

It was most interesting watching the progress of my new stock; they throve well and grew enormously, so that in the course of about five years one weighed close upon 5 lbs., and many turned the scale at half that weight. This big fellow used to go into the scales once or twice every year, and had a hook in his mouth once only. One day an old fishing acquaintance came to me in great glee, saying he had just given a dinner to some kindred friends, and had set before them a 5 lb. trout he had caught in the stream below my house. "Bad luck to you all," was my reply, "you have eaten my big trout which I have been educating for years; he got away a night or two ago."

It may be asked how my fish were caught when I wanted to weigh them? I put a cask in the moat and laid it on its side, with one end knocked out. This was at once appropriated by the master fish as the most eligible spot. When he was wanted I turned the cask on end; a landing net did the rest. In this way every fish in the moat could be caught in a very short time.

But my fish had to be fed, and my entomological proclivities

were set to work to devise a plan. I had noticed the enormous quantities of caddis worms that fed on some neighbouring beds of watercress. Taking a hint from this I planted a long, narrow bed in the stream above the middle moat, leaving a small unplanted space along the side where the fish could freely travel up and down. This turned out a perfect success, and beyond often regaling them with worms to accustom them to my presence, I took no further trouble in the matter. There are those who suggest supplying other fish, such as minnows, as food for trout. This is of doubtful utility; for would not the minnow consume much food which the trout would otherwise have eaten? And supposing a thousand or two had been put into my moat, they would have been gobbled up at once. I did put in a few perch, and even these were attacked and eaten when small enough. One trout swam about for three days with a perch fixed in his jaws: but he got him down at last. Another way to feed fish is to stir up the bottom with a rake; a good meal is often thus provided by destroying the lurking places of the insects in the mud. The bottom itself, too, becomes more wholesome by this treatment, and the oftener in reason it is employed the better.

My trout used to spawn in the stream above the moat, and sometimes in the moat itself; but it was a useless proceeding, for the hole they made in which to deposit their ova soon became filled up with mud, and I need hardly say that to the eggs of the Salmonidæ a layer of mud is absolutely fatal. Many a time have I put my head into a laurel bush and watched the process of spawning carried on by a pair of 2 lb. fish in clear water six feet off. Coyness is as apparent in a female trout as in most creatures of her sex. Sometimes her mate would swim up to her side as she was preoccupied in clearing the hole, at the end of which the spawn is placed. She pretends he is in the way, and her objection is shown by the gentlest flap of her tail. Then he would retire to a respectful distance, only to come forward a moment or two afterwards, so as to pay due court to his spotted bride. I have at times collected some of the ova thus deposited in the stream, and have put them in boxes to hatch: but it was a difficult matter, and the results were not worth the trouble. At last I set up a hatchery at one end of the moat, and spawned the fish myself. My apparatus consisted of several boxes which I filled with ova, a tub or two, with a tap to allow a small stream to trickle through the boxes continuously, and under the taps two pots filled with sand as an improvised filter to stop the mud from getting into my boxes. The results, however, were not always satisfactory, for accidents of various kinds occurred; but I learned a good deal, and my experiments were most interesting. I discovered so many enemies of the young fry, that it became a wonder to me that any, in my part of the world at all events, could possibly grow up into adult fish. The most terrible and insidious foes I had to deal with were leeches; not the ordinary horse-leech, but a

tiny black thing as long as one's little finger nail, and, when not lengthened out, hardly larger than the head of a good sized pin. These wretches were ubiquitous, and their numbers astonishing. The bottom of the water was alive with them, and, in spite of all my filtering, on one occasion they found their way into my boxes, and destroyed a thousand freshly hatched fry. By way of experiment I placed six of these leeches in a saucer with three of the fry a few days old, and also an equal number of unhatched ova. In an incredibly short time the skins of the fry alone were left, while the outer membrane of the ova proved too tough for their attacks. When the umbilical sac had been absorbed, the boxes soon became too small for my baby fish; so I made a tiny pond for them at the side of the waterfall, taking elaborate precautions against their escaping into the lower moat, where their lives would not have been worth a day's purchase. No sooner were they installed in their new quarters than a fresh enemy came upon the scene. In the first few minutes several of the troutlets turned on their sides, and on carefully removing them I found a leech-like looking creature had fastened on their gills. It was no larger than the little black fellows I have already described, but was lighter in colour and with a large sucker at one end. When once attacked by these they always died. I have seen the same animal on the eyes and head of adult fish, but its name I do not know. Leeches, then, are among the most formidable foes to trout in early life. To these may be added a whole host of insects that are to be found in every piece of water the country through. The savage larva of dragon flies, and of most water beetles, devour anything and everything almost that comes in their way. Verily their name is legion. Need I name any more enemies, from that beautiful little shark, the stickleback, upwards? No, it would take too much space; and besides, the larger they are the better they are known, though the amount of destruction seems to be in inverse ratio to the actual size of the foe itself.

I have witnessed some other curious and interesting sights connected with my troutery. I have been present at, and seen fought out, pitched battles between rival fish. They generally last half an hour or so, and are carried out with determination and ferocity on the surface of the water. It is easy to tell when one takes place, for the two fish slowly circle round each other, generally head to tail, a few feet apart. Their back fin is raised, and, with the tip of the tail, is out of the water. Then one suddenly dashes at the other and tries to seize him just above the tail. If he succeeds, he holds firmly on, shaking his enemy like a bulldog, and driving him broadside through the water. Short, thick fish generally gain the day, for they can turn more quickly than long and slender ones. What these fights were about I never could quite understand. They usually took place in the summer. Was it for some coveted spot, or do they settle who their wives are to be some time before the spawning season comes round?

As I sat one day in my summer-house a kingfisher settled down on the wire netting quite close to me. I was concealed by some honeysuckle. There he remained for several minutes before choosing to move on. These birds were always to be seen in my garden, and very proud indeed I was of their company. Another day, it was early in September, a covey of partridges that were terrified by being shot at, settled in the moat. Here my landing net came in useful, and I secured several brace without taking out a game license.

People used often to come and have a look at my trout. One afternoon a number of ladies and gentlemen, members of a bicycle club, rode up to my door and asked permission to see them. I always fed my fish when standing as close as possible to the edge of the water, so as to accustom them to my presence, and on this occasion my trout performed beautifully. My gardener soon produced a pot full of worms. My visitors were quietly ranged close behind me, and the fish rushed out to seize the worms the moment they were thrown one by one into the water.

One of the greatest regrets I had when leaving the south coast for East Anglia was when taking leave of my pet trout.

Market Weston, Thetford. EDMUND THOS. DAUBENY.

A SEA OF GLORY.

ON the night of September 14, the dwellers and visitors along the coast of easternmost England, and the fishermen who were afloat on the sea not far from the shore, were able to witness a spectacle such as is seldom seen around the English coast. On that night, from dusk till midnight, the waters lying between Lowestoft Ness and the network of sandbanks outside the roadstead were phosphorescent to a degree of brilliancy surpassing anything of the kind remembered by the oldest beachmen and fishermen of the district. During the day the temperature had been the highest recorded this year, the thermometer registering 125·5° in the sun. The sea temperature, taken at Lowestoft pier-head at 11 a.m. was 64°. For several days the weather had been warm and calm; and on September 14 there was, during the early part of the day, only a faint breeze from the N.N.E. In the evening the breeze strengthened a little, so as to set slight ripples flowing on the otherwise smooth surface of the sea, and these, flooding up the shelving beach and washing over the coastline shoals, caused a scarcely perceptible murmur that might have been only the breathing of the breeze. For some hours a change in the weather had been anticipated, for at noon the barometer fell to below thirty inches; but it rose again

before 9 p.m. and all signs of rain vanished. The evening was sultry, the air being very oppressive, and the moonless sky was somewhat murky, so that the stars only shone faintly and were frequently almost obscured. There was a high tide, which at flood flowed further up the beach than is usual at the time of year; and the water in the harbour rose to within a few feet of the landing stage of the steam-tug pier.

In the harbour the water was as smooth as glass, and the long lanes of coloured light, which were the reflections of the harbour lamps, were undisturbed by the slightest quiver or wave swell. Around the weed-hung timbers of the piers which surround the yacht basin the phosphorescence was scarcely so noticeable as it had been on several previous nights; but from the pier-head a grand and impressive sight was to be seen. As far as the eye could see out into the dark night, the sea was aflame with countless points of brilliant phosphorescence. Every ripple that stirred the surface of the water was a streak of cold blue fire; every wavelet that danced to the piping of the rising breeze was tipped with the same unearthly light. So faint was the starlight that the sea was like a sheet of the blackest satin, upon which the phosphorescence gleamed and glowed like innumerable marsh-fires flickering over some lonesome mere. The effect was not merely grand but awe-inspiring. The scene seemed too unnatural to be a phenomenon of the home waters, and viewing it from the piers one could almost believe one was on the deck of some ocean steamer churning its way through a tropical sea. The waters between the shore and the sandbanks were sprinkled with glorious spangles, which seemed to reflect some unseen light as they were swept shoreward on the swelling tide. The sea was like a witch's vast cauldron, and the background of gloomy sky suggested the dusky setting of some weird transformation scene.

Now and again a boat would put out from between the piers and glide away out to sea. The night was too dark for either the boat or its occupants to be seen; but its progress could be easily traced by the vivid streams of translucent fire that flowed by it on either side. Every dip of the oars caused a sudden gleaming like a flash of aqueous lightning, and when they were lifted in the air the drops that fell from them sprinkled the water with melting discs like evanescent gems. Along the beach the blue flame flooded up the shingle with strange serpentine coilings, which vanished among the pebbles just as others appeared a little distance from the land. Out on the sandbanks there were occasional flashes, as though a gathering of sea sprites, carrying will-o'-th'-wisp lanterns, were at play amid the shallows. These flashes reminded one of Darwin's description of a phosphorescent sea through which he sailed in the *Beagle*, when a little south of the Plata. "As far as the eye reached," he writes, "the crest of every wave was bright, and the sky above the horizon, from the reflected glare of these living flames, was not so utterly obscure as over the vault of the heavens."

The wonderful spectacle attracted the attention of people who were strolling along the sea-front or on the piers for several hours, and has since been the subject of much discussion. Phosphorescence is frequently seen in the harbour at Lowestoft, where its presence is attributed to floating putrescent matter, such as is usually too plentiful in the neighbourhood of fish wharves; and the phenomenon is not uncommon in the North Sea, especially during the summer and autumn months. In the present instance there can be little doubt that the display was due to the presence of myriads of phosphorescent animalculæ, similar to those known to inhabit southern seas. Putrescent matter cannot have been sufficiently abundant to have diffused a brilliant luminosity so far out to sea, that is, unless one accepts the theory that the luminous state of the sea is the result of the decomposition of innumerable minute animalculæ, which, in consequence of a spell of calm weather, have died upon or near the surface of the water. In any case there seem to be grounds for the belief that such phenomena are considerably influenced by meteorological conditions, and it is for this reason that note has been taken of the weather, and air, and water temperature at the time and just before the occurrence of September 14.

W. A. Dutt.

YELLOW BUCKTHORN.

(*Hippophaë rhamnoïdes* L.)

THIS very pretty shrub is a good deal cultivated in gardens and shrubberies by the sea-side, but I do not remember to have seen it inland, nor do I know whether it will grow away from the sea. I am, however, now making the experiment by sending seeds and cuttings to my own home in Nottinghamshire.

The shrub is not as well known as it deserves to be. It grows from about one and a-half to perhaps five feet high. The leaves are narrow and grey, of the colour of the foliage of the olive, almost white underneath. The berries, of a bright orange yellow, cluster in masses along the stalks, under the crown of leaves. The grey, green and yellow together are an uncommon and very harmonious combination of colour.

Whether it is really indigenous I do not know, and should be glad of information.* It grows wild on the Folkestone cliffs,

* *Hippophaë* is certainly indigenous. It is recorded in Watson's "Topographical Botany" from East Sussex, East Kent, East Suffolk, Norfolk, North Lincolnshire, and North-east Yorkshire; but it is said to be "probably planted" in other counties.—Ed. *N.N.*

but I have never heard how it came there. It grows in great quantities on the Norfolk coast about eight or ten miles north of Yarmouth. Five years ago I found it covering the mud cliffs at a hamlet called Scratby. This was in August, and as I was about to gather a branch from one of the brightest bushes, out flew a warbler, whose nest, full of eggs at this late season, was quite hidden among the thick leaves and berries.

This year, in November, I re-visited the same spot, and to my regret found that the whole of the undercliff and its vegetation had been washed away by the high tides which each year are making further encroachment on this coast. A fisherman to whom I spoke told me that no such tide had ever been known as one in November, 1897. He knew the buckthorn well, and told me that there was none left between Scratby and Newport—another small hamlet two or three miles further north. I went on to Newport, and there I found it covering the mud or sand banks, together with the sea rushes. The poor people and fisher-folk call it "wyvables."* I asked what the word meant and was told "It means nothing—it is only the name we know for it." The tradition is that some years ago a ship was wrecked here containing berries which were washed ashore, and grew and spread, but the tradition does not say whence the ship came. The berries have a very strong and pungent taste, and also smell, when crushed, not unlike apples. The children sometimes eat them and they seem to do them no harm. A woman here said to me, "An aunt of mine had the yellow jaundice, and she thought perhaps that's what the yellow berries was sent for—they must be sent for something. So she took them to try, but they did her no good nor yet no harm."

M. H. Mason.

OBSERVATIONS FOR YOUNG BOTANISTS.

I.

The Study of Germination.

INTRODUCTION. — With the object of introducing articles of a somewhat educational character, it is proposed to give, for the benefit of young botanists especially, a series of short papers on various phases of plant life, with the view of showing them what to observe, as the study of Botany must, of course, be always pursued by examining the living plants themselves, and noticing their peculiarities of structure and habits, especially in connection with their adaptations to their surrounding conditions of life.

* This name appears as wirwivvle or wyrvivle for Norfolk, in Messrs. Britten and Holland's "Dictionary of English Plant Names." Ed. *N.N.*

Some of the most remarkable properties of plant life are to be seen in the germination of seeds. They are easy of observation, and it is the hope of the writer that the following descriptions will lead the student to make the simple experiments herein described himself.

Structure of Seeds.—To note the different ways seeds germinate, it will be as well to procure some acorns, cress, beans or peas, onion seed, wheat, Indian corn and date stones. They are to be sown in flower pots filled with fine moist earth or sand. The larger seeds should be well soaked for twenty-four hours or more before being placed on the surface of the soil in the pots.

The parts of a seed consist of the seed skin, which is soon ruptured; within this is the *embryo*, which begins to grow by protruding the *radicle*, or primary stem, from the end of which the root is developed. In addition to the embryo there may be reserve food-material, or *endosperm*, as in the four last-mentioned seeds. In the first three there is none.

The Root; *Geotropism.*—The first thing to notice is that the radicle turns downwards. To name this motion the word "geotropism," or "the turning earth-wards," has been invented. It is supposed to be due to gravity, as seeds at the antipodes behave in the same way. If a bean has developed a long radicle and it be placed horizontally, so that the tip is supported by a Λ shaped piece of card, it will be observed after a few hours that the tip while growing bends downwards; but the curvature is at a point some little distance from the actual apex. This means—as careful experiments have shown—that while the tip is sensitive, the "irritability" is conveyed up the root to a higher point, where the curvature actually takes place. The absolute apex consists of a cap of protecting tissue; but the sensitive part is situated just behind it.

Aphototropism.—This sensitive spot is also affected indirectly by light, in that light causes the root "to turn away from it," as the above word means, towards the darker side. This may be well seen in plants growing near a window which can develop roots into the air, as *Saxifraga sarmentosa*.

Circumnutation.—The root, as well indeed, as all parts of plants, are constantly moving during growth. It is a kind of "bowing around," as the above word signifies. It may be easily seen in a radicle, when grown as in Darwin's experiments. He took some germinating seeds of horsechestnut and other plants. They were placed in a tin box, kept moist internally with a sloping bank of clayey sand, on which smoked glass rested inclined at an angle of about 65° with the horizon. The tips of the radicles were placed so as just to rest on the upper end of the glass plates, and as they grew downwards they pressed lightly on the smoked surfaces and left zigzag or irregular tracks due to their movement in trying to circumnutate as a root or stem would do if growing freely in the air.*

* This description is taken from Darwin's "Movements of Plants," p. 28.

Hydrotropism.—Another property characteristic of roots is a sensitiveness to water. An interesting experiment of Sachs' illustrated this "turning water-wards." Take a square piece of coarse wire gauze, bend it so as to make a trough and fill it with wet moss, then place some well-soaked beans within the moss. The gauze must be suspended in a slanting position. When the beans have developed their radicles, as soon as they protrude below, the moist surface being closer to one side of the tip, since the gauze stands at a steep angle, the attraction for water overcomes that of gravity; the result is that the tip bends back and re-enters the moss; but now gravity reasserts itself, and the tip comes out again, to repeat the process, so that it may thread itself in and out of the gauze.

Aphercotropism.—"Turning away from an obstruction" is a peculiarity discovered by Darwin. His experiment was as follows:—After allowing a radicle to be well developed in peas, beans, &c., the seed is suspended in the air. A tiny piece of card is attached to one side of the tip by a little gum; the tip will now move away from the vertical position, on the opposite side to the card. The tip may make one or more complete circles in a vertical plane; and it has been known to pass through the first loop so as to tie itself into a knot. This explains how a radish was once dug up and found to be thus tied up.

The Shoot; *Circumnutation.*—This and *phototropism*, or "turning light-wards," induces the stem, whether it be the radicle, "hypocotyl" in mustard, or plumule "epicotyl" in the bean or oak, to rise up into the air. In the latter instance the plumule first grows in the form of an arch; and if it be beneath the soil, by circumnutating it is enabled to free itself from the earth above it, and so gets out into the air. It then straightens itself and grows vertically upwards. This upward growth is due to the sensitiveness of the apex to light; for if a box have the bottom removed and be provided with a gauze shelf below the lid, and if seeds be sown on earth on the shelf and the lid be now closed, the box being supported so that the interior can only be illuminated by reflection from a mirror below, then the shoots are found to grow downwards, *i.e.*, towards the light and in the direction of and not in opposition to gravity.

Respiration.—Seeds when germinating require air, moisture and a fitting temperature. The air supplies oxygen gas, so that the living protoplasm may respire; for respiration is as absolutely necessary for plants as for animals. The protoplasm absorbs oxygen, which then combines with carbon liberated by chemical decomposition of substances containing it. It is then given off as carbonic acid gas. To prove this, let a quantity of well-soaked peas or beans be put into a glass bottle having a wide mouth and well-fitting stopper. Let it be placed in the sun or warmed, as heat intensifies respiration in plants. After a time, so much carbonic acid will have been produced at the expense of the oxygen that, if a lighted taper be carefully and

quickly inserted into the bottle, it will go out, being suffocated by the carbonic acid gas. A quantity of the flowers of daisies or dandelions will answer the purpose as well. If a small quantity of lime-water be put in and well shaken it will become milky by absorbing the gas, thus making carbonate of lime.

Differences in Germination. — In noticing how the seedlings appear, it will be observed that there are differences. Thus in an acorn the plumule first arises while the thick, fleshy cotyledons remain below ground. This can be well seen by growing an acorn in a wide-mouthed bottle half-filled with water. The acorn should be well soaked first, and the radicle allowed to appear, and then suspended over the water, the tip just touching it.

In mustard-and-cress, the plumule remains arrested, while the radicle ascends and forms the stalk, the cotyledons turning green at the summit.

In the case of the onion and date, after the protrusion of the radicle, the single cotyledon also escapes excepting its tip, which remains bent down and embedded in the endosperm. This is gradually dissolved and then absorbed by the cotyledon, which finally frees itself and becomes erect.

In the wheat, the primary radicle is arrested and several secondary roots come out instead. This arrest of the primary or axial root is characteristic of monocotyledons and aquatic dicotyledons, as may be well seen in germinating waterlilies, or in growing seeds of the water crowfoot (*Ranunculus heterophyllus*), if they be sown on mud in a glass bowl kept full of water, and when they are about an inch high examined under a microscope. It may be added that this is one of numerous points of agreement, making it pretty certain that the first-mentioned class has descended from aquatic members of the second.

George Henslow.

REVIEWS AND EXCHANGES.

Drift from Longshore. By "A Son of the Marshes," edited by J. A. Owen, with a frontispiece by A. Thorburn. London: Hutchinson & Co., 8vo. Price 6s.

There is always a numerous *clientèle* who await with interest a new volume of his personal natural history experiences from the pen of "A Son of the Marshes," and they will not be disappointed by this, his latest book. Additional interest is given to it by the mention of the actual name of the home of his youth, Milton-next-Sittingbourne. We can sympathise with the editor in the disgust at seeing "pochard" persistently misprinted as "poachard" which led her to pen a letter of protest to the *Athenæum*.

Wild Animals I have Known and 200 *Drawings.* By Ernest Seton Thompson. London: David Nutt. Printed in New York, 8vo. Price 6s.

Only last month we had the pleasure of reviewing a book illustrated by Mr. Thompson, and now we have a work entirely from his hand, letterpress and illustrations alike. There is a charming air of the open prairie about the whole, and a truth to Nature that even the tragedy which the author shows to be the

inevitable ending to stories of wild life does not diminish, *Raggylug, the Story of a Cottontail Rabbit*, and *Wully, the Story of a Yalter Dog*, will prove of deep interest to all students of instinct. The illustrations and entire get-up of the book are perfect.

Wild Life at Home: How to Study and Photograph It. By R. Kearton, F.Z.S., Author of "With Nature and a Camera," &c. Fully illustrated by Photographs taken direct from nature, by C. Kearton. Cassell & Co., 8vo. Price 6s.

It is difficult to decide whether to admire most, the untiring perseverance of the two brothers who may well be considered as joint authors of this delightful and most Selbornian volume, or the skill with which they have presented their experiences in the form of a practical manual for the nature-lover. Just as complaint has often been made of the amount of microscope power running to

SPIDER AND WEB (*Photographed by flash-light*).

waste, so in these days of universal photography there is a danger of a similar waste of time, money and negatives, over worthless subjects. Mr. Kearton shows us how to observe living beings without shooting or otherwise destroying them, and to make a permanent record of our observations. As is shown by the two illustrations, which by the kindness of the publishers we are able to reproduce, his instructions range from one end of the animal kingdom to the other; and, if

we may not see our way to emulate his eerie feats of cliff-climbing, any of us with an entomological bent will be glad of his suggestions as to a new method of study.

SHAG STRETCHING HERSELF.

Board of Agriculture Leaflets, Nos. 50—53. These recent additions to the leaflets issued gratuitously by the Board of Agriculture deal with Water Wagtails, or "Dishwashers," the White or Barn Owl, Gooseberry Blight (*Microsphæria grossularia*) and the Pear Midge (*Diplosis pyrivora*). Each leaflet is illustrated.

We are glad to learn from *The Animal World* for December—a good number—that Mr. Long has made an order including all the suggestions of the R.S.P.C.A. for the prevention of cruelty to decrepit horses exported.

As our valued Transatlantic contemporary, *Our Animal Friends*, notices the comments on the Crystal Palace Bird Show in our November number, we trust it will also notice our apology in the December issue, and our hopes of a practical result.

Received.—From the Botanical Society of America, *The Origin of Gymnosperms and the seed habit*, the Presidental Address of Prof. J. M. Coulter; from the Humanitarian League, *Humanity* for December; *The Cost of a Seal-skin Cloak*, by Joseph Collinson; from the London Anti-vivisection Society, *Lord Lister and Experimentation; A Bird's-eye view of a great question*, by S. G. Trist (Sixth edition); *Who are the ultimate victims?*; *Knowledge*, *Science Gossip*, *The Naturalist*, *The Irish Naturalist*, and *The Animals' Friend* for December.

NATURAL HISTORY NOTES AND QUERIES.

Lightning.—In reference to Mr. Daubeny's letter in this month's NATURE NOTES, it may be of interest to record that on the evening of August 10, 1895, a deodar of about forty feet in height, standing in Kew Gardens, was struck by lightning very much in picture style. The top of the tree for about fifteen feet was torn off diagonally, and lay, itself uninjured, at an angle of about 45° on the

shattered middle third of the tree; while the lower part was apparently untouched. The appearance gave one the idea that the middle of the tree had *exploded*. I have a photograph of the wrecked tree taken the day after it was struck.

7, *Holmesdale Road, Kew.* E. HUBBARD.

Lightning.—With regard to Mr. Daubeny's interesting article on lightning-struck trees, the latter are, no doubt, as spectacles of destruction, as a rule disappointing. On the other hand, I can recall an instance of utter and immediate destruction which came under my notice in the year 1890 in the Isle of Zante. During our visit a most violent thunderstorm broke over the island. One of our walks had been to inspect a magnificent specimen of the date-palm which grew in "solitary grandeur" in a vineyard some two miles out of the town. To our dismay then, we learnt, on the morrow of the storm, that this giant had been struck. We therefore paid a second visit to the spot; and sure enough, there stood some twenty-five feet of trunk, while, at its base, lay the crown of leaves with some length of trunk attached! On examining the latter we found that it had the appearance of having been twisted and wrenched off by some mighty hand—as a boy, without a knife in his pocket, would twist a hazel stick to break it. I asked Mr. Forster, the then head of the Eastern Telegraph in the island, how he would account for the phenomenon. His theory was that, at some time, the trunk must either have been bound by a hoop of metal, or pierced by a ring of nails, which served to check the downward current, with the lamentable result which I have tried to describe. Though our acquaintance had been of so short duration, we felt that we had lost a friend, and the island one of its numerous points of interest.

Knowle Grange, Sidmouth. WILL. V. VICKERS.

"A Cuckoo Myth."—On page 237 Mr. Joseph Collinson writes:—"Some one stated that the young cuckoo ejects his foster-brothers. This is not true." Who the "some one" is he does not inform us. Perhaps it was me. Anyhow it is *perfectly correct*, notwithstanding Mr. Collinson's assertion to the contrary. For what purpose do we write? Is it to give information and interest readers, or to mislead them? What I have seen accomplished time after time, and others too, we are at liberty to believe, I presume, without being considered by readers, writers of "falsehoods," "absurdities," &c. It is as true as night will succeed day and day night, and Mr. Collinson writing without knowledge of the subject proves nothing. I venture to say that at the time of life that young cuckoos eject either eggs or young they have the "anatomical structure" for performing this feat, in contradiction to the remark that it "has no existence." The back of a young cuckoo *is hollow*, and in this hollow I have seen robins' eggs placed by the young cuckoo one after another and worked up the side of the nest and tumbled over outside, the young cuckoo with marvellous instinct stretching out its wings alongside the back to prevent the eggs rolling off. This is no "myth," and as long as cuckoos exist so long I have no doubt anyone with eyes to see can follow up the life history of young cuckoos and the ejecting of both eggs and young foster-brothers and sisters as I have done.

The Wren's Nest, Astwood Bank, Redditch. JAMES HIAM.

Mr. Joseph Collinson (NATURE NOTES, December, 1898) treats somewhat contemptuously the belief that the young cuckoo ejects his foster-brothers from the nest. Mr. Collinson, apparently, supposes the belief to be wholly founded on observations of Vaccination Jenner. I do not know what Jenner wrote on the subject. His statements may be discredited. But this is what appears in "The Origin of Species" (sixth edition, 1882):—"In the case of the European cuckoo, the offspring of the foster-parents are commonly ejected from the nest within three days after the cuckoo is hatched; and as the latter at this age is in a most helpless condition, Mr. Gould was formerly inclined to believe that the act of ejection was performed by the foster-parents themselves. But he has now received a trustworthy account of a young cuckoo which was actually seen, whilst still blind and not able even to hold up its own head, in the act of ejecting its foster-brothers. One of these was replaced in the nest by the observer, and was again thrown out." In the list of "chief additions and corrections," prefixed to the sixth edition, is this entry: "The statement with respect to young cuckoos ejecting their foster-brothers confirmed." Darwin, then, on the

evidence before him believed in the practice, and Darwin was not easily satisfied in questions of fact. A little observation is better than a great deal of theory, even though the theory be Charles Waterton's "so far back as 1863." Many will prefer Charles Darwin's conclusions in 1882, and there may still be "life left in the old falsehood." Why should the direct evidence of Mr. James Partridge, given in NATURE NOTES (November, 1898), be ignored? He was an eye witness.

Brighton. J. L. OTTER.

Rare Birds shot near London.—A male and a female pied oyster-catcher were shot yesterday morning by Mr. J. Atkinson, of Barnet, in a field near Rickmansworth. These birds are the constant inhabitants of the seashore, and though nowhere plentiful, yet are widely dispersed over the globe, being met with in almost every country, and more frequently off the Narrows, at the mouth of New York Harbour, the Bahama Islands, off the coasts of the Japanese Archipelago, and also off the shores of New Guinea and New Zealand. It is not often, however, that they are seen far inland, their food chiefly consisting of oysters and other shellfish. Those shot yesterday appeared to be fatigued as the result of an extra long flight. Shortly after this capture was also shot another very rare bird, the male scoter, black duck or black diver. These birds are only sparingly distributed over the coasts of England, where they feed on small shellfish, of which they are very fond. They are often killed in France, and sold to eat on fast days and during Lent, some peculiar idea existing that their flesh is akin to fish, by which pleasing subterfuge people console themselves for a possible breach of the observances respecting meat on fast days.

[We take the above record of how we encourage rare birds from the *Daily Mail* of November 24. The mention of the eating of the Black Scoter (*Œdemia nigra*) by French Catholics during Lent is of interest, as it engaged the attention of our great naturalist, John Ray, in 1683 and 1684. Its French name is macreuse, and Ray's correspondent, Dr. Tancred Robinson, writes: "I have been told by several of the most learned priests beyond sea, that the macreuse was as much a fish as the barnacle (and indeed I am of the same opinion), that the blood was the same in every quality with that of fishes; as also that the fat, which (as they falsely affirm) will not fix, dry, or grow hard, but always remains in an oily consistence. Upon these and other reasons the Sorbonists have ranked the macreuse in the classis of fish."—ED. *N.N.*]

Wasps—Bullfinches (vol. ix., p. 219).—My remarks on the above were written with the most innocent intentions, and I hope Mr. Hiam will accept them as such.

Market Weston, Thetford. EDMUND THOS. DAUBENY.

Hybernating Butterflies.—With the exception of *Vanessa Antiopa*, *V. C-album* and *Colias hyale*, the hybernating butterflies are fairly common hereabouts, and *V. Polychloros* is more abundant in ordinary years than in any part of England with which I am acquainted. This autumn, however, there is a singular scarcity of all without exception. I have seen two or three *V. Urticæ* and *V. Io*; one *V. Polychloros*; but not a single specimen of *V. Atalanta*, *Cynthia Cardui*, *Colias edusa*, or *Gonepteryx rhamni*. This is corroborated by a neighbouring observer. EDMUND THOS. DAUBENY.

SELBORNE SOCIETY NOTICES.

Donations towards Reduction of the Deficit.—The Council acknowledges with thanks the receipt of the following donations: Miss J. Bridge, 2s.; Sir J. Colquhoun, Bart., 27s. 6d.; Rev. A. R. Miles, 2s. 6d.; Dr. A. J. Powell, 5s.

Additions to the Selborne Library.—The Librarian reports that the following books have been received from the Editor, and are hereby acknowledged with thanks: "The Flora of Donegal," by Henry C. Hart, B.A., T.C.D.; "Murby's Science Series—Skertchly's Geology," revised by James Monckman, D.Sc.Lond.

Council and Committee Meetings.—The next meetings of the Council will be held on Tuesdays, January 3, and February 7, at 5.30; of the Field Club Committee on Tuesday, January 17, at 6; and of the Magazine and Leaflet Committee on Tuesdays, January 17 and February 21, at 5.30.

NEWS FROM THE BRANCHES, &c.

Clapton.—At the monthly winter social meeting held at the North East London Institute on December 17, Mr. C. E. Allnutt read a very interesting paper on "The Dawn of History."

Croydon and Norwood.—A meeting of the Branch was held at the Public Hall, Croydon, on November 28, when a lecture was delivered by Mr. E. A. Martin, F.G.S., on "Croydon; Geologic, Prehistoric, and Historic." Sir Frederick T. Edridge occupied the chair, and in his opening remarks made some interesting and important statements in regard to the water-supply of this important borough. He considered that the public were greatly indebted to the Society for arranging such lectures as this one. There was a large attendance. At the conclusion of the lecture, a vote of thanks was proposed by Dr. Hobson, B.Sc., who expressed a wish that the Selborne Society and the Croydon Microscopical Society, of which he was President, might as far as possible work together in harmony for the good of the inhabitants of the town. It was not possible to report the meeting in our last issue, having to go to press on an earlier date in the month than that of the lecture.

On December 14, the Hon. Sec. gave an address to about 200 children of the Mint Walk Band of Hope, in the Temperance Hall, Croydon, on "Dogs and Dog Stories," illustrated by lantern slides kindly lent by the Humanitarian League.

Ealing.—The Rev. H. E. U. Bull, M.A., lectured on the New Forest at the Latimer Upper School, Hammersmith, on November 15. The lecture will be repeated after Christmas for the benefit of those boys who were disappointed of gaining admittance owing to lack of room.

Kensington.—The Hon. J. Scott Montagu, M.P., has kindly consented to give an address on South African Flora and Fauna, illustrated by lantern views, at St. Philip's parish room, Earl's Court, in February. Admission will be by ticket, for which application should be made to the Secretary of the Society. The price of the ticket and particulars of the meeting will be given in the February number of NATURE NOTES. The proceeds are to be devoted to the fund for the reduction of the deficit.

Selborne Society Lecture.—On December 20, a lecture on "Gilbert White and the village of Selborne," was delivered by Mr. Edward A. Martin, F.G.S., at the Public Hall, Sidcup, in connection with the Sidcup Literary and Scientific Society. The chair was occupied by Mr. Rayment.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 110. FEBRUARY, 1899. Vol. X.

SELBORNIANA.

Cut or Uncut? It has been suggested that Nature Notes should be issued with the pages cut. As this would involve some little expense, the Council invite an expression of opinion from the members.

A Selborne Almanack.—Mr. E. A. Martin writes:—"The Editor referred in his speech at the last Conversazione to the number of records which were sent to him, of the first appearance of flowers, birds, insects, &c. A new year is now commencing, and I think a useful and interesting compilation might be made if the observations which Selbornians make during the year were brought together, and a Selbornian Almanack were published on January 1, 1900, giving in parallel columns (i.) Gilbert White's first appearances; (ii.) Selbornians' dates of the same, and (iii.) a blank column, to be filled in for the current year. Any such notes which could not find room in Nature Notes could then find a place on the Almanack, the name of the observer to follow the date of his or her find. The almanack should, I think, take the form of a large wall-sheet, as being the most convenient form for the study or library. I shall be glad to undertake such a compilation. Who will send me help?" This is also a subject on which the Council would be glad to learn the opinions of members. The Massachusetts Audubon Society have issued a very beautiful calendar for 1899, but it consists of twelve coloured plates of birds with descriptive text, so is not a wall-sheet.

Elephants.—Mr. W. Cocksedge writes:—"I see that on p. 2 of the January number, Mrs. Hubbard advocates the use of xylonite billiard balls by players, in order to prevent the

threatened extermination of the elephants which furnish the ivory of which the balls are made. I notice that Buckland says on p. 93 of his first series of 'Curiosities of Natural History'—'I consulted Mr. Jacques (the ivory turner of Hatton Garden), upon this subject, and he tells me that billiard balls are made only of East Indian ivory, and not of African ivory. The African ivory contains more moisture and gelatine than the other kind; and this occasions the ivory to shrink in drying, and consequently the ball, when turned, to get out of the round; it is, however, very valuable to make other articles, *not* billiard balls.' It would thus seem that billiard balls are made of the ivory of the Indian elephant, which is not, I believe, in such danger of extermination as its African cousin."

Docking Horses.—We are glad to see an excellent article on this barbarous fashion in our American contemporary, *Our Animal Friends*, for January. At the same time a correspondent sends us an absurd paragraph from the *Newcastle Daily Journal* of January 11, saying that to allow harness horses "to have long tails is great cruelty and most dangerous," as "any driver will tell." The writer fails to distinguish between trimming the long hair of the tail and docking, which is the removal of flesh and bone, and he seems to consider every driver incapable of managing his reins. Even *The Field* says, "It may be a necessary operation in the case of some harness horses which have thick and coarse tails which are for ever getting over the reins; but for saddle horses we regard it as quite unnecessary"; but surely it would be an easy matter to so construct our vehicles and harness as to do away with any necessity for the practice.

Squirrel-Hunting in the New Forest.—Several correspondents have called our attention to this custom, which has, we believe, been somewhat recently organised, in the interests of the local publicans, in connection with Bank holiday squirrel-pie suppers. One hundred and fifty-six squirrels are said to have been killed in the Lyndhurst district on Boxing Day. Our contemporary, *The Outlook*, while stigmatising the custom as barbarous, says that in young plantations squirrels have necessarily to be thinned out. Now there are some comparatively young plantations in the New Forest: large as is the number killed we doubt if it is more than a thinning of the number existing: it is not alleged that the method of killing is in any way a cruel one, nor is it denied that the squirrels are truly wild and are desirable as food. We learn that—thanks perhaps to the destruction of owls and hawks, and the prolific character of the species—squirrels had, until recently, much increased in numbers, and that they suffered very extensively from mange. We shall be glad to have further information as to the conditions of existence which affect this lovely denizen of our woodlands.

Rabbit Traps.—The Rev. E. T. Daubeny writes :—" When walking in a village near Bury St. Edmunds I saw two warreners staggering home under a load of steel traps they used in catching rabbits on a large neighbouring estate. What untold suffering have each of these instruments of torture caused ! ! And this in enlightened England ! ! There are many effective and comparatively painless ways in which rabbits can be taken without their being subjected to the cruel teeth of a trap for hours and hours. It seems wonderful that owners of property are not more thoughtful for the creatures on their estates than to allow such barbarous implements to be used."

Breitschwantz.—This fur resembles extremely fine and beautiful caracul, and it is to be known by its remarkable lightness, the skin being as thin as fine cloth. It is impossible here to describe the peculiar method of its manufacture ; perhaps it will be sufficient to say that each skin costs the death, not only of a lamb, but very probably of a sheep, and in any case entails revolting cruelty to the latter. An English fashion paper, after feebly condemning the method of obtaining the fur, goes on with freshly-awakened ardour to say — " We shall not only see entire costumes of this delightful (!) fabric ; it also lends itself admirably for those delightful ' fanfreluches ' garnitures which run round the undulations of jackets and mantles, reaching more than half way down the skirt. In pure white, this will make a *furore*." We hope it will make a *furore* — of another kind than that anticipated by the manufacturers. Not only the women for whose use this cruelly-obtained fur is designed, but also their husbands, brothers, and friends should join in a crusade against it. It is an unfortunate truth that the efforts of humanely-minded women cannot stem the current of a cruel fashion, patronised by heedless sisters. If all masters of households, however, refused to pay bills for any garment that included the objectionable fur, and all men who met lady acquaintances wearing " entire costumes " of " breitschwantz " would make a point of remonstrating with them, the fashion might be scotched at its commencement. Even the osprey never came up to this last horror.—*Dublin Independent*.

Cage Birds.—The National British Bird and Mule Club have excluded from their list of birds eligible to compete for the club's cups and medals the swallow, house martin, sand martin, night-jar, and cuckoo. This is a step in the right direction, and will very much discourage the keeping of such birds.

One for the Vandals.—S. L. P. writes : " If any paper knows which way the wind of public opinion is blowing certainly it is *Punch*, and the ' Almanack for 1899 ' strikes a blow for the feathered defenceless ones, an honest, straight-

forward blow, too. It should be welcome to Selbornians. The scene is a country road, and the road is crowded by men, boys and one lady in a carriage—each person carries either gun (some double barrels) or pistol; the legend is 'In defence of their country? Oh, dear, no. Fact is, a rare bird has been seen at the brick ponds a little further down the road!' Well done, Mr. Punch, our compliments to you."

Wild Birds' Protection Acts.—"Bird catching, bird nesting and indiscriminate shooting," writes a correspondent, "appear to go on in most places unchecked, just as though the acts were non-existent, it being apparently nobody's business to enforce them;" but a correspondent writes to *The Standard* from Wimbledon Park, "I think it only just to acknowledge the powerful and effective help *The Standard* has rendered in the redress of an intolerable nuisance. I refer to the hitherto perpetual slaughter of our native song-birds and other small birds on Sundays. The ventilation of this topic in the letters that have appeared in *The Standard* has sufficed to put an entire stop to this nuisance since the appearance of the correspondence on 'Sunday Morning with the Gun' in your columns."

A Prospective Sanctuary.—The East London Water Company propose to construct two reservoirs on what is now Chingford Marsh, each of which will be over a mile and a-half long and over half-a-square mile in area. The Rector of Chingford, Mr. Russell, who has held the living for a long time, and is a keen naturalist, says in a letter, quoted by *The Standard*—"The Marsh used to be the resting-place of many wild birds, but the Cockney gunners now frighten everything away. I have frequently seen heron, duck, teal, curlew, snipe, sandpiper, kestrel, sparrow-hawk, &c. One of my terriers caught a water-rail once on the river bank. Otters appear from time to time; two were shot the other day, and a third has been seen lately, but I fear will not long escape the gun. There used to be a few polecats, but I have not heard of any during the last fifteen years." "Everyone," continues *The Standard*, "who knows what Sunday is like on the Marsh will understand how all living things have been terrified from it. For a long time it has been a favourite resort of Hackney gunners. But if the East London Water Company go on with their scheme of two great lakes it is obvious that all this will be changed. A Water Company is not, indeed, likely of its own initiative to take any particular care of our fauna and avi-fauna, but its officials are bound, for reasons of their own, to keep away intruders. Probably, too, they will make an island in the middle, if it be only for the purpose of getting rid of the mould removed during excavation. Thus an ideal sanctuary will be formed. Any pool connected with the Lea is sure to stock itself with fish, and we hope that the creatures which prey on them will be undisturbed. In a

short space the otter may be trusted to find out that the days of wanton gunning are past, and that he may make his holt there without fear. Herons from the heronry at Wanstead, kingfishers from the Thames, teal, curlew, snipe, and sandpiper will come back if they can do so in safety."

Wholesale Extermination of Ferns.—A correspondent calls our attention to the advertisement in the daily papers of Devon and Cornish fern-roots to be supplied in large numbers at low prices, aud asks if nothing can be done to check this exterminating process. We have alluded to the subject in former years. Nothing is, we fear, to be gained by any appeal to any supposed finer feelings in the purveyors of these things, who act as they do simply because there is money in it. It might be possible, as suggested some time ago by Mr. David Howard, President of the Essex Field Club, to alter the law as to wild plants and animals, so that the landed proprietor could take proceedings for damage done to them as he can in the case of crops, and not merely for trespass, when he has to prove damage to a fence. But the more feasible check would seem to be a diminution in the demand for wild roots by the general determination on the part of all growers to buy none but cultivated specimens.

Autumn "Tints."—Mr. E. A. Martin writes: "I should like to say a word of protest against the fashion which has been noticeable during the past autumn, of using artificially dyed leaves and twigs, made somewhat to resemble autumn tints, for purposes of indoor decoration. Most extraordinary, too, some of these 'autumn tints' are. Surely, if there really is a wish present in a purchaser of such monstrosities to be surrounded by leaves of autumn's colouring, the purchaser will take the trouble to procure the genuine article."

OBSERVATIONS FOR YOUNG BOTANISTS.

II.—The Study of Roots.

ROOT-HAIRS.—In studying the peculiarities of roots, the root-hairs should be noticed, which arise by an extension of the superficial or epidermal cells, just behind the point. These adhere to particles of soil and help to give a purchase to the tip when entering the soil. Root-hairs, it may be observed are much more abundant in a dry loose soil than in a moist, heavy one, as they increase the surface of absorption. Many roots, as those of bulbs, often have none. In other plants they may vary in quantity according as the root passes through a dry or a wet soil.

Secondary Roots.—On digging up a small seedling plant,

the main or tap-root will have descended vertically, though the apex grows downwards in a spiral course. This accounts for the fact that two roots growing side by side are sometimes found to be twisted spirally together. Lateral or secondary roots are not so strongly influenced by gravity, and so grow out at various angles from the first. This is of course an advantage, so that the soil may be searched for water and nourishment in all directions.

The origin of secondary rootlets should be noticed. With the aid of a simple microscope or strong pocket-lens they will be seen to issue from a deep-seated layer below the surface. This is called the pericycle. It is the same layer which gives rise to the fibrous tissue in many stems, as of flax and hemp. The secondary roots are consequently said to be "endogenous," *i.e.*, "growing from within;" whereas branches on a stem are continuous with the latter and are "exogenous," or "growing from without." The way these roots issue is interesting, because instead of merely bursting through the cortical tissue of the "mother-root," they carry a "digestive cap" at the end, which secretes a ferment. This dissolves the overlying tissue, which is now absorbed by and so nourishes the young root until it escapes externally.

Circulation of Water.—If a young plant, say of wheat, be pulled up and gently washed it will be found impossible to remove all the particles of soil and minute fragments of stones adherent to it. The fact is that they are cemented to it, as the roots insinuating themselves adhere to the soil, in order to extract the film of water on the particles. The water then percolates through the cell-wall. This has no visible pores, but both animal and vegetable membranes are permeable to water. Thus, if a piece of bladder be stretched over an inverted funnel, which is to be filled with a solution of treacle or brown sugar and water, and then dipped into a vessel of pure water, the latter after a time will become darkened and sweet, while the water in the funnel will rise up into the neck. This process is called "osmose;" and may be described generally—omitting causes of modifications with different kinds of membranes and fluids—as the rule that, if two fluids of different densities be separated by a membrane, diffusion takes place between them until equilibrium is established, the less dense fluid passing through the more rapidly of the two.

This process of osmose takes place between the cells of vegetable structures and so helps to diffuse the fluid sap from cell to cell. The result is that the water of the soil which contains only about 2 or 3 per cent. of mineral matters passes more readily into the plant, and therefore causes great tension in the cells. This is relieved by the water passing on, inwards, from cell to cell, until the long open vessels are reached, when it readily passes up into the stem.

Respiration.—This is another function of roots, as of all

parts of plants. Protoplasm, to live at all, must respire. Consequently if seeds be sown too deeply they become suffocated; and similarly, if the roots of trees, &c., get into a wet, clayey soil, the oxygen of the air is impeded and they are liable to become unhealthy. Hence arises the importance of forking over the soil round the roots of plants when it has become hardened.

Structure of Roots.—This will easily be seen to differ in some respects from stems, for without studying the anatomy, which requires the aid of a strong microscope, it may be noticed that the cortical layers are relatively thicker in roots, as also in subterranean stems, than in aërial branches. The use of this is to protect the central cord of wood, by which the chief strain is felt, when the aërial parts oscillate with the wind. In herbaceous plants the cortex frequently stores up starch and other nutritious foods for the plant's future use.

While the cortex is thick the fibrous layer (pericycle) is deficient; for this is a tissue especially required by slender stems which easily bend to the wind but do not readily break. The pericycle of a root is employed in a different way, for it makes the thick fleshy outer part of our garden roots, as the parsnip, carrot, turnip, raddish, &c.

Growth of Roots.—Now let us see how roots grow. If a seedling has acquired a good tap-root and then be allowed to grow vertically over water so as to be readily observed, and small dots be made with Indian ink from the apex backwards at intervals of half a line, *i.e.*, one twenty-fourth part of an inch, after some hours it will be found that, while the terminal spot is carried onwards by the dead root-cap, a portion, about one line in length, *i.e.*, containing two dots, has elongated, the dots behind having retained their original positions. If the piece thus lengthened be again marked, another small portion only will elongate as before. This shows that it is only a very small part of a root which elongates; and this is obviously an advantage to the root, since it is obliged to insinuate itself among the resisting particles of soil.

If, on the other hand, an internode of a stem of some rapidly growing plant, such as the hop, be marked, it will be found that all the dots will become more widely separated from each other after a definite time has elapsed.

Aërial Roots. — Roots are not always underground, for many plants climb by means of modified roots, as in the familiar case of the ivy. In this plant the roots are formed on the shaded side of a shoot, and although in all probability originally stimulated into development by contact with a rock or tree, they are now often produced in anticipation of contact. Their use is to fix the ivy firmly to a wall; but in tropical orchids the roots have an additional use, for they can absorb moisture, &c., from the surface of the tree upon which they grow.

In the case of some fig trees, as the Indian Banyan, aërial

roots come out of the branches, and when they reach the ground, penetrate it, and then they assist the main trunk by absorbing water and so act as additional stems.

Root Contraction.—In order to bring subterranean stems below the surface of the soil to their proper depths, the roots often have an important duty to do by contracting their length. The process begins in the oldest part of the root and continues downwards towards the apex. Transverse folds or wrinkles are well seen in many tap-roots. They are produced by a change of form in the cortical cells, which shorten in a longitudinal direction together with a transverse extension, and absorb water at the same time. The central cylinder of the root, in which are the vessels, becomes forcibly compressed. The outer surface then gradually dies and thus becomes folded into ridges. The amount of actual shortening varies from 5 to 10 per cent. of the total length of the contracting part, or even to 30 or 40 per cent. The effect is a gradual pulling down of the whole plant into the soil. This may be seen in the way the tips of long bramble shoots, when rooting in the soil, are dragged below it.

Many plants possess no contractile roots, as the colchicum, tulip, &c., others have some contractile and others not so. Not infrequently contractile roots are fleshy, and as this feature is due to the cortex it is especially such roots which are contractile. If a bulb has reached its normal depth by the aid of successively produced contractile roots, and these are no longer produced, and it be again placed near but below the surface, contractile roots will again be produced in order to carry it once more down to its proper level.

George Henslow.

AN EAST ANGLIAN "HANGER."

THE grass-bordered path at the foot of the Hanger is covered with a ruddy carpet of fallen beech leaves, amid which the nutty mast lies hidden, its presence only revealed by its pebbly hardness beneath the feet. Much of the mast, however, still hangs on the trees, and will remain there all through the winter, long after the last of the acorns have been scattered by the boisterous winds. There was such a wind last night, and signs of its havoc are to be seen on every side. Bristly bunches of sweet chestnut burrs are strewn all about the slope of the Hanger; many of the elms and ashes are almost leafless; and even the hardy oaks have been partially stripped of their scarcely withered leaves. One stormy night has wrought more change than a fortnight of quiet autumn days. Yet to-day one can hardly realise that the "little summer of St. Luke" is past, so warmly shines the sun and so pleasantly

breathes the south wind. If it were not for the red drift of beech leaves and the spotted yellow flakes from the sycamores, one might well imagine that spring were near, for now that the elm branches are almost bare the fretted edges of the twigs can be discerned, where the young buds are appearing. The hazel and alder catkins, too, have formed, though they will not lengthen until February. A glance at the undergrowth of the Hanger, however, reveals bright clusters of hawthorn berries and scarlet hips of the wild roses, while here and there the bushes are festooned with red-fruited bines of bryony.

At all times of the year it is pleasant to wander along the footpath by the Hanger. When the hot sun rays scorch the roadside hedges and open heathlands, there is cool shade to be found beneath the overhanging trees, and when the keen north winds sweep over field and fen there is shelter there from the biting blast. On this sunny late autumn day we recall earlier rambles that led us this way and revealed to us the Hanger clad in the full glory of its summer verdure. To climb the steep wooded slope was then to find oneself amid a dense undergrowth of fresh green bracken, not, however, without its open spaces where the wild flowers flourished and made the air fragrant. The scent of sunny banks of wild thyme tempted one to linger in these miniature glades until the desire to gather a bunch of late blooming bluebells and purple orchids made us venture again into the shadow of the chestnuts and birches. Those birches were then among the most beautiful things in the world for us: with the delicate tracery of their slender branches half hidden by the dainty leaves, they looked like large maidenhair ferns held up on silvery stems against the sky's bright summer blue. Overhead among the tree tops the wood-pigeons kept up a continual wing-clatter which, while it sometimes seemed to startle the blackbirds from the bramble bushes, did not disturb the squirrels that frisked among the boughs.

A pair of kestrels built amid the dusky foliage of one of the storm-rent firs, and the male bird was often seen hovering over the water-meadows that stretched away from the foot of the Hanger. A night-jar, too, had its home somewhere on that shady slope, and its "churring" was one of the most familiar sounds to those who passed that way at night. Yet there were many people who could not tell you what kind of bird it was that broke the silence of the night with such a strange note, and a townsman who stopped to listen to it was heard to say that it must be some "foreign bird." Yet the Hanger has long been the haunt of the "churn-owls," and almost any summer evening, in the twilight, they may be seen moth-hawking along the border of the water-meadows. The real owls used to frequent the slope, and trees are pointed out in which they are known to have lived; but a mistaken activity on the part of local game-keepers has destroyed them all or driven them away. Yet one would have thought that the wooded retreat of the Hanger might have been

left sacred to them, for it is one of those tracts of sylvan waste-land that are too small for coverts and do not repay the clearing of the woodcutter. The owls, however, are gone, and one is thankful that the Hanger still remains to us, and is likely to do so as long as it commends itself to the land-owner as a shelter for his sheepfold in lambing-time.

A local legend describes a heathy knoll on the crest of the Hanger as the site of a Roman encampment, and there is a little rocky basin, overhung by rugged alders, that is called a Roman well. The legend, no doubt, has its origin in the fact that denarii of Victorinus have been ploughed up in the neighbouring fields, and that not far away there is a veritable Roman stronghold, age-worn and lichen-stained, yet as firm in its foundations and massive in its structure as it was many centuries ago. There are many evidences of the work of war-waging proprætors along the upland heights that overlook the fenny water-meadows which, since the days of the Iceni, have been reclaimed from a wide waste of waters; but the Hanger has attractiveness and charm that need no legendary stories to enhance them. Even now, in these late autumn days, there are few pleasanter places for a rural ramble. Although the golden-rod is faded and the bracken is withered and sere, the wood-pigeons are still clattering among the tree tops and the squirrels gambolling on the lower boughs. Rabbits are frisking amid the fern, and now and again a rustling of the fallen leaves denotes the presence of field mice or a boring mole. One has only to remain still and quiet for a few minutes to be able to detect some sign of active wild life, though it may be but the twittering of a belated dragon-fly's wings against the stems of the dry grasses. On the calmest of autumn days one can hear the leaves falling. They drop from the twigs without the fanning of a breath of breeze, and as they fall their tapping against the lower branches is as distinctly heard as though it were the flapping of the wings of a startled bird.

Along the foot of the Hanger, between the grass-bordered path and the base of the slope, runs a narrow dyke or "holl," as the country folk call it, almost "grown up" with sedge, bur-reed, brooklime, and water parsnep. At times this shallow dyke dries up, and then its bed is seen to be covered with a thick, mossy coating of ivy-leaved duckweed. The alders overhang this weedy holl, which receives the greater part of their leaves and catkins, and their rugged roots, moss-grown and bristling with brushwood, extend far along the banks. The straggling brambles that grow between the alders retain their leaves all through the winter: just now they are yellow with the twining bines of the wild hop. A few elder bushes are losing their berries—some have fallen, others have been carried away by the birds—and the corymbs from which they have disappeared have assumed a deep claret hue. Underneath them is a dense growth of water-pepper, the leaves of which are brilliantly variegated

with crimson and gold. At all seasons of the year there is an abundance of colour along the dyke below the Hanger; even in December there are fresh green water-parsneps among the amber blades of the withered sedge. Some strange water plants, too, are to be found there—plants that have become rare since the draining of the fens and are only to be discovered in out-of-the-way bogs and neglected dykes. So, at whatever time of the year one visits the Hanger and rambles along the footpath below it, there is something to be seen or heard that provides entertainment for the nature-lover.

W. A. Dutt.

A "FAIRY" STORY CONTINUED.

SOME years ago I wrote an account* of the habits of my tame whitethroat "Fairy," and many readers were kind enough to feel an interest in such a remarkably intelligent little bird. He is still alive and well, and being one of our migrants and so delicate as to be very rarely kept as a pet, I am rather proud of my success in keeping this bird in health and vigour for six-and-a-half years. He is in lovely plumage, and as full of life and energy as ever. I used to speak of my pet as "she," but I have since learned that the possession of a pure white breast is the distinguishing mark of a male whitethroat, and indeed I might have known by his loud, sweet-singing powers that he belonged to the superior sex.

Six years' close companionship and petting have developed all "Fairy's" powers to a remarkable degree. By various notes and chirpings I can perfectly divine what is passing in his birdish mind, and he knows that I understand his language, and is indignant accordingly if I do not at once respond and obey his commands.

One special call-note means "I want a bath," and if this is not attended to immediately "Fairy" will try to drown himself in my water jug, a desperate act which he well knows will bring me at once to the rescue.

His habit of hiding in some out-of-the-way corner in my room is sometimes too provoking for my patience. The breakfast gong will have sounded; I dare not leave the little scapegrace to his own devices, and yet find him I cannot! At last, after perhaps twenty minutes' search, I catch sight of the little snowy breast hiding behind an ornament on the mantelpiece, and when discovered "Fairy" flies straight into his cage, and flirts from perch to perch, giving out his most exulting notes to show his delight at having baffled me in my search for him.

* In "Inmates of my House and Garden." (Fisher Unwin.)

The hours of liberty before breakfast are utilised by "Fairy" in picking up flies and insects of any kind, and now and then I have been rather dismayed to see either a bee or a wasp in his little beak. Naturally I endeavour to obtain these trophies from him, fearing lest he may be stung—I might just as well try to catch a will-o'-the-wisp! With crest upraised and swiftest flight, the wicked little bird baffles all my efforts, and, perched on an inaccessible curtain-pole, will enjoy his forbidden prey.

But there is another and a very touching side to his character—I am sure the little creature knows what sympathy means. Once, in early morning, I was grieving over sad tidings, when my thoughts, which were far away, were recalled by a tender little voice close to my ear. "Fairy" came on my finger, looked fixedly at me, and then nestled down in my hand as if he would say, "I'm sorry for you, but don't forget you have still got me to care for you."

Somehow the wordless action did bring comfort, and some wonderment too, for it really seemed almost uncanny that so minute a creature could be so human in its action.

These remarks may seem almost too trivial to record, but I think they have a certain value as proving the educating influence of human companionship in the case of a bird which seems scarcely to have ever before been observed in captivity.

As a rule I am against the caging of English song-birds. Still if we have saved an unhappy little fledgling from a miserable death, I think "Fairy's" biography shows that we can make its life within a human dwelling both unusually prolonged and unquestionably happy.

ELIZA BRIGHTWEN.

ORNITHOLOGY AND CYCLING.

THE interesting article by Professor Henslow on "Geology for Cyclists," recently published in NATURE NOTES, prompts me to say that there is also a good deal to be said in favour of bicycling for ornithologists, especially for those who live in towns. Of course an ornithologist must not always go out on his machine, for he is then confined to the road, and cannot leave it to pursue the bird across the fields without the risk of having his machine stolen. But in some ways a bicycle is extremely useful to him. It is an excellent means of getting a general idea of the distribution of certain species over a wide area. More general information on this subject can be procured by a few hours' cycling than can be acquired in several days trudging about on foot. And there is another point in its favour, which is, that birds will allow bicycles to pass within several feet of them when they would not

allow a person on foot to approach within as many yards. Moreover, unless you are riding very fast, the sound made by your wheels and by the air rushing by your face does not prevent your hearing the songs around you, though, of course, you cannot stop and listen to them without dismounting. Whenever I can get away from my work, I have an inclination to follow the singing of birds. Often, when I have felt it absolutely necessary to hear something besides the Kensington Gardens thrushes and robins, I have ridden down the Uxbridge Road in the early morning before breakfast, until I have reached a field over which a lark was singing. Before the days of bicycles this was impossible.

The most enjoyable ride I ever had was by myself one Saturday afternoon last May. During that ride I heard the songs of the blackcap, nightingale, garden warbler, wood wren and many others; and I heard or saw in all forty-seven species of birds. It was a run down the Ripley Road over Hindhead to Liphook—where I spent the night—riding home the next morning. To tear from the summit of Hindhead into Liphook, down several miles of a beautifully graduated slope, with the blaze of an evening sun in your face and masses of golden gorse all around you, is the most exhilarating thing in the world. It is enough to make you almost burst with *joie de vivre*. During that one ride I saw or heard the following species: greenfinch, chaffinch, linnet, peewit, jay, magpie, jackdaw, rook, crow, wood wren, willow wren, chiff-chaff, nightingale, blackcap, garden warbler, whitethroat, sparrow, starling, blackbird, thrush, missel-thrush, kestrel, corn bunting, yellowhammer, great tit, blue tit, cole tit, stonechat, whinchat, heron, robin, hedge-sparrow, lark, nut-hatch, tree pipit, pheasant, redstart, swallow, martin, sand martin, swift, pied wagtail, wren, flycatcher, bullfinch, wood-pigeon and cuckoo.

The distance from London to Liphook is about forty-four miles. The sand-martin was only seen near Mortlake; the heron, redstart and nut-hatch were only seen in Richmond Park; all the other species were observed or heard between Ripley and Liphook.

January, 1899. A. Holte Macpherson.

REVIEWS AND EXCHANGES.

Vagaries. By Axel Munthe, author of "Letters from a Mourning City." John Murray, 1898.

Although this does not belong to the class of book that I usually see noticed in NATURE NOTES, that is to say, it cannot be called a work on Natural History, yet I think that many Selbornians will be glad to know of it. The author admits that he has had a good deal of difficulty in settling on his title, for he says in his preface "Essays is much too important a word for me to use, and stories it certainly is not, for I cannot remember having ever tried to invent anything." The name that he has eventually chosen, however, fits the book very happily, and in his "Vagaries" he takes us with him to many places and scenes, and we are introduced to his friends with such delightful freshness and spirit, that they immediately become our friends too. No one could help, for instance, wishing that they might meet Don Gaetano, the organ grinder, though the little monkey is no longer sitting huddled on the organ dreaming of burnt almonds, and her master, who nearly starved himself to keep her alive, has not, I think, ever brought himself to fill up her place. These are only two out of Dr. Munthe's large number of friends and acquaintances, some of them with sad enough lives, such as Monsieur Alfredo, the author of endless tragedies, whose story is a tragedy itself, and others, like the German poet at Capri, who are most amusing company to listen to. Then there are many dogs, donkeys and creatures of all kinds, for Dr. Munthe is a real lover of animals, and in "Zoology" and in many other bits scattered up and down the pages, he shows himself to be a keen observer and naturalist also. Here is a charming picture of a Capri lizard.

"From out the ivy covering the old stone wall behind us a little quick-tailed lizard peeped every now and then to warm itself in the sun. Whenever you catch sight of one of these little lizards you should whistle softly; the graceful little animal will then stand still, gazing wonderingly around with her bright eyes to see from whence the sound proceeds. She is so frightened that you can see her heart beat in her brilliant green breast, but she is so curious and so fond of music—and there is so little music to be heard inside the old stone wall! You have only to keep quite quiet to see her emerge from her hiding-place and settle down to listen attentively. Something rather melancholy is what pleases her best; she likes Verdi, and I often start with 'Traviata' when I give concerts for lizards."

His views on sport, as revealed in the chapter headed "Blackcock Shooting," would not find very ready acceptance everywhere, nor would he be a welcome guest at many shooting parties, as this quotation will show. "They," the shooters, "became absolutely furious when with my unfortunate absent-mindedness, I happened to let out that I had made a little private excursion before sunrise, and by chance had come across some blackcock. 'But had you not time to fire at them?' they cried, shaking me by the arms and pulling at my coat. 'Yes, of course, I had time to fire, but the blackcock had also time to get away.' 'Did you not aim at the thick of the covey?' they yelled. . . . 'No, I think that I aimed at a little cloud, and for the matter of that, I think I hit it, for a moment later I saw that the sky was beautifully blue.'" What happened next must be read! it is evident that Dr. Munthe's sympathy for the condemned blackcock had proved too strong for his enthusiasm as a sportsman.

On another subject, however, that of the persecuted birds of Capri, everyone must be in agreement with Dr. Munthe. A mountain slope on that island has long been used by migratory birds as a resting place where the tired crowds drop down for the night; but when morning comes the numbers that go on their way are sadly diminished. The greater part have fallen victims to the nets and traps spread for them by the people of Capri, and thousands of thrushes, larks, pigeons, &c., are thus destroyed every season. I have been told that Dr. Munthe has a scheme for purchasing this bit of ground and turning it into a sanctuary for birds, and so putting an end to this wholesale destruction. If, as seems likely, "Vagaries" is to make this possible, I wish the book every success, for its own sake as well as for that of the birds.

HELEN C. MARINDIN.

My Horse: My Love. By Sara Buckman-Linard, illustrated. T. Fisher Unwin, 8vo. Price 3s. 6d.

It is certainly a novelty to have a very business-like treatise on thorough-bred and Arabian horses, their veterinary treatment, breeding and use in racing, written by a lady and put mainly in the form of a dialogue. Valuable as is the information which Mrs. Buckman-Linard has put together, we own to preferring the direct narration of the second part, which deals mainly with English racing, to the catechetical form of the first part, which was originally issued separately in America in 1892. As might be expected in so true a horse-lover, the authoress speaks out plainly about the barbarous cruelty of docking.

Golder's Hill, Hampstead: Its Natural History Beauties. By James E. Whiting. Hampstead: S. C. Mayle. Price 2d.

This excellent little pamphlet, which is reprinted from *The Hampstead and Highgate Express*, with a preface by Dr. Danford Thomas and a view from the house as a frontispiece, forms an adequate guide to the natural history of London's acquisition. We shall hope soon to see a second edition, when a few errors in scientific names can be removed.

The Wild Bird Protectors' Handbook (*Lancashire*). Manchester: Sherratt & Hughes. Price 1d. In stiff covers, 6d.

We congratulate the Manchester Branch of the R.S.P.C.A. on this handbook, for which we have no word but praise. It contains a map, a list of species scheduled in the Protection Acts, and a complete list of the birds of the county, with notes as to migration and food, references to the specimens in the Owens College Museum, and local names. The following note on "Bird food in winter," shows the practical character of the work:—

"Barley meal, well mixed with boiling water, is said to be the best and cheapest food; but kitchen scraps of every kind are acceptable, and meet the different needs of different birds, hard or soft billed. Bones and pieces of fat should be hung well out of reach of dog and cat, and half a cocoa-nut, dangling from a branch, for the tits. In severe weather *water must be supplied.* Above all, *leave the birds their berries.* They are now robbed of tons of precious food, for the sake of securing a little colour in Christmas decoration."

Map of Public Footpaths in the Neighbourhood of Barnet and Hatfield, prepared by the Barnet centre of the Commons Preservation Society. W. and A. K. Johnston. 1s. 6d.

This is an altogether excellent map on the scale of 3 inches to the mile, mounted on linen. It will be invaluable to the naturalists and other pedestrians of the district.

We are glad to learn from the *Animal World* for January, that the R.S.P.C.A. propose to start a new journal appealing more to adults than their present publication, which will then be adapted "solely to purely educational purposes."

The Animals' Friend for January, with its Children's Supplement, is an exceptionally good number, not only in its illustrations, but also in its literary matter. *Inter alia*, Freda Clapham writes recommending white China silk handkerchiefs, Maltese silk lace scarves and Shetland shawls as tasteful and sufficient substitutes for furs; and Miss Carrington has an article on "The Ages of Animals."

From *Our Animal Friends*, one article in which we have noticed on a previous page, we learn with pleasure that the Audubon Societies of America are to have a bi-monthly magazine, to be called *Bird Lore*, under the editorship of Mr. Frank M. Chapman, of the Museum of Natural History, New York.

Humanity for January contains a strongly, but not, we think, too strongly worded open letter to Lord Coventry, entitled "Royal Sport."

The Avicultural Magazine for January contains an article by Mr. H. R. Fillmer, Secretary of the Avicultural Society, entitled "The Limits of Legitimate Aviculture," in which he says, "I think the feeling is growing that we ought, as much as possible, to encourage the keeping of birds in aviaries, and discourage the use of cages." He further writes, "All the species of swallow seem most

ill-adapted for life in cage or aviary, and I think we ought to do all we can to discourage their capture. There are other species, such as the wren, the chiff-chaff, and the willow-warbler, which endure captivity so badly. . . . that their capture seems almost undesirable. . . . So long as their confinement leads to the death of nine out of ten within a few weeks, and ninety-nine out of a hundred within a few months, it appears mere cruelty to cage them."

Science Work for December is the first number of what, we are convinced, will prove a very valuable "monthly review of scientific literature." It is issued, towards the end of the month, at 3d., or 2s. 6d. per annum prepaid, by Messrs. Robert Aikman & Co., 20, Shudehill, Manchester, under the editorship of Mr. Waller Jeffs. We wish it every success.

In *Knowledge* for January, besides the other contents, as varied as usual, our vice-president, the Right Hon. Sir Edward Fry, and our branch secretary, Miss Agnes Fry, begin an account of the Mycetozoa, those living things which nobody, as yet, can with certainty classify as either plants or animals. "Some intimates of these strange 'beings,'" say the authors, "try to get over the difficulty by inventing pet names, and call them 'myxos,' or 'myxies,' and, on the whole, we incline to adopt the latter word. It is short, and it rhymes with 'pixies.'"

Science Gossip, which now is able to boast that at 110, Strand, it, alone among scientific magazines, has its own premises, contains in its January number a letter of inquiry from Mr. M. J. Teesdale, anent the rare phenomenon of iridescence observed on the surface of Lake Windermere in October last.

Among the various interesting articles, which, in addition to a most liberal supply of notes and news, mark the beginning of the life of *Natural Science* in its new Edinburgh home, the palm must, we think, be given to Prof. Sollas's "Funafuti: The Study of a Coral Atoll," his Friday evening discourse to the British Association at Bristol. It appears strange that no address of editor or publisher, beyond "Young J. Pentland, Edinburgh and London," appears on the magazine.

Received.—*The Naturalist* and *The Irish Naturalist* for January.

NATURAL HISTORY NOTES AND QUERIES.

Obituary.—Recently, deeply lamented, at Lyndhurst, Hants, the emu, formerly the property of the Hon. Gerald Lascelles. As its death is stated to have been caused by swallowing a screw of tobacco stolen from a workman's coat pocket, this fatality is a sad example at once of the misuse of tobacco and of the neglect of the laws of *meum* and *tuum*.

Popular Natural History.—"Oh, Uncle Rufus, do look at these tadpoles in this pool; and to think that some day all those horrid, wriggling things will be butterflies!"—*Windsor Magazine.*

The Mild Winter.—As might be expected, we have received many instances of the exceptional mildness of the winter. A sparrow's nest and a blackbird's nest, each containing eggs, found in Lord Salisbury's park at Hatfield; honey-bees in search of honey and thrushes and redwings in full song, observed by Mr. J. Hiam, on January 9, at Redditch; a slow-worm on a gravel path on January 8, the snowdrop (*Galanthus Elwesii*) in flower on the same date, and two young rabbits found drowned on the 9th at Clitheroe, according to the testimony of Mr. G. B. Milne-Redhead; and the note we print below from Mr. Warner, of Abingdon, on the toad, are instances.

A Dog Story.—Here is a story showing the sagacity of the dog, vouched for by the *Leisure Hour*:—"On the high road between Bordeaux and Arcachon a certain mongrel collie is known to, and much respected by, hundreds of people on account of its almost human intelligence. It invariably accompanies a couple of bullocks that draw a cart loaded with charcoal into Bordeaux, and returns with it empty to the locality where the wood is burnt. Although the cart is in charge of a man, the oxen are practically in charge of the dog. The animal walks on ahead leading the bullocks, and always strictly observing the rules of the road. When the slow-moving beasts have to turn to the right, the dog barks on that side of them, and when to the left he barks on the other side, the oxen having perfectly learnt their part, and being quite willing to obey a quadruped many times smaller than themselves. The dog learnt his business by observing his master, who was much surprised one day to find his companion so accomplished. To lead a bullock-cart, and to know exactly what to do on meeting other traffic, seems as near an approach to human reasoning as can be attained by the intelligence of the brute."

Tameness of Birds.—I have read the robin story in the December number of NATURE NOTES, and can give another and similar instance of trustful friendliness on the part of a bird. In 1896, being at the time without a cat, I became intimate with a family of sparrows. The hen-bird made the first advance, venturing to take some crumbs off a rug which covered my legs as I lay on a couch in the garden. Some little time afterwards she came into my sitting-room through the French window, and was soon followed by her spouse and two young birds. This happened many times, the sparrows appearing to know perfectly well that I had early dinner at one. CONWAY DIGHTON.

2, *Blenheim Terrace, Cheltenham.*

London Birds.—On December 4, I watched for some moments a nuthatch in Victoria Road, Wimbledon Park, within two and a-half miles of "the busiest railway station in the world"—Clapham Junction. It ran up and round an oak tree, finishing by scaling a brick wall. I would add that a fortnight ago a great tit appeared in the garden here, about 150 yards from the station referred to. Truly, there are great delights in store for Londoners if only the raiders will leave the birds alone. W. JOHNSON.

Clapham Junction.

A Curiously-Marked Spotted Flycatcher.—On Sunday morning, August 13, 1893, I had an opportunity of examining closely a very strange-looking bird as it perched within a few feet of me and remained motionless for several seconds. It then flew across the garden, settled on a clothes-line, and gave me another good view. It was a spotted flycatcher, with a broad white mark on the nape of the neck narrowing towards the eyes and giving the bird a most curious hooded appearance. The next year, in another Cheltenham garden, I saw the same bird. He was then catching flies wherewith to feed a young one perched on the garden railings, and I particularly noticed the white mark on his neck. CONWAY DIGHTON.

2, *Blenheim Terrace, Cheltenham.*

Crossbill (*Loxia curvirostra*).—In the *Morning Post* for November 22, the occurrence of several of these birds at Bournemouth is recorded, and we hear also of its being seen in the New Forest. It has, we believe, for some years bred in this neighbourhood, where its food, the seed of the pines, is so plentiful.

Hawk.—Our garden boy found a dead hawk hung in a tree the other day, apparently caught and strangled between two twigs. Can anyone explain this circumstance? A. M. B.

Green Woodpecker.—One day, the end of November, while at luncheon, a green woodpecker came within about fifteen yards of where I was sitting, and searched the lawn for food. He found an ants' nest, which had been under one of the flat irons that supported the pole of the lawn tennis net. Though the ants had retreated for the winter, the woodpecker's powerful bill had no difficulty in piercing the ground to where they were lying. He drove it into the earth almost

as deep as his eyes, moving his head from side to side to enlarge the hole; and then leisurely picking out the ants one by one. When he had gone away I inspected the field of his operations. They were confined to a space about the size of a dinner plate. Several of the holes were as big round as a pencil, funnel-shaped and more than an inch across the top. This is the closest view I have ever had of this very shy bird. EDMUND THOS. DAUBENY.

Market Weston, Thetford.

Bullfinches.—When I wrote for *Land and Water* some years ago, a very good naturalist, the Hon. G. F. Berkeley, told me that these birds only attacked buds already infested by a grub laid by some insects, and the buds would in any case drop off. I believe Mr. Frank Buckland was on the side of the bullfinches. Every bird and wild animal in *this* vicinity is ruthlessly killed, save the, in my opinion, destructive sparrow. He eats all my peas, and destroys whole beds of spring flowers, yellow crocus especially, by nipping the stalk to extract the sweet nectar. HELEN WATNEY.

Berry Grove House, West Liss, Hants.

Breeding of Eagle Owls at the Zoo.—Most visitors to the Gardens have observed with interest the fine eagle owls (*Bubo ignavus*) in the small aviary exclusively appropriated to them, just by the camel-house, which has had a long succession of occupants. It is somewhat strange that these birds have never nested till now, and this makes the hatching-off of a young bird all the more welcome as an unexpected New Year's gift to the Society. It is not easy to assign a reason for the fact that this species never bred before in the Gardens. The conditions would seem to have been all that could be desired for the purpose; an inner compartment was provided, and here the birds passed the day, perched side by side on a cross-bar, looking solemn and wise as owls are wont to do. But when visitors approached the wirework they were apt to ruffle their feathers and glare ominously at the intruders on their privacy. In confinement the nesting habits of these owls, which occur in Britain as occasional stragglers from the Continent, are exceedingly simple. A hole is scratched in the earth in a dark corner of the aviary, and here, often without any nesting material, the eggs are deposited and the brood hatched off. When they leave the egg they are entirely covered with white down, which in about three weeks is exchanged for the second down, greyish-brown in hue. When the young birds are about five weeks old the feathers begin to show, and in another month they are able to fly up to their perches, and nearly rival their parents in size. The most celebrated case of the breeding of this species in captivity is that recorded in Stevenson's "Birds of Norfolk," of a single pair that hatched off a brood regularly for fourteen years in succession in the aviary of Mr. Edward Fountaine, at Easton, near Norwich. At one time this gentleman had twenty-six of these owls in his aviary, and had then given away thirteen others. The colony of owls formerly living at Arundel Castle were supposed to belong to this species, but were shown by Mr. Borrer to belong to the American species (*Bubo virginianus*).—*Standard.*

Frogs and Toads.—We are told and often read that frogs and toads retire during the winter into the mud at the bottom of ponds and lakes; and that, therefore, they are under the water continuously for three or four months in the year. Is this so? Here there are great numbers of these batrachians, owing I believe to the many "pits," or small ponds, which afford them suitable breeding places. In these "pits," early in the spring, it is a common thing to see a struggling cluster of twenty or thirty male toads, and in the midst of them a solitary female, which has been killed by the overpowering number of suitors; drowned, I fancy, from not being permitted to come to the surface of the water to breathe; or as a village lad told me, "the little 'uns holds the big 'uns down and *drownds* them." These creatures are able to remain submerged for a long time, and the time no doubt can be much increased during hybernation, when their vitality is low; but does it extend to months? Our labourers often come across them when ditching in the winter. They find them in the mud at the sides of the ditches, and in such like places, where they are frequently, but not always, under water. I have occasionally found both frogs and toads hybernating some distance from any water. EDMUND THOS. DAUBENY.

Market Weston, Thetford.

The Toad.—As an evidence of the extraordinary mildness of the present winter, I noticed, on January 7, a large toad perambulating my garden path, apparently in search of a supper. The evening was very mild and wet. As an observer of reptile-life of many years' standing, this is the first occasion on which I have seen our humble and useful friend pursuing his avocation in mid-winter. The frog, on the contrary, is frequently to be seen about in mild winters. On one occasion I saw a specimen of the latter on January 26. In this instance froggy was stretched stiff and frozen on the grass of an orchard, having evidently been tempted forth by a few genial days which had occurred beforehand.

Fyfield, Abingdon. W. H. WARNER.

Frogs in Rock.—I have often heard stories of frogs being found embedded in rocks, and I have always been very sceptical about their truth; but I have just had an experience that seems to throw some light on the question. We were sinking a shaft in our clay working, for getting clay for making encaustic tiles, and had to go through some rock. The men came across some frogs embedded alive therein. They were in pockets or holes of about three inches diameter, and I have portions of these domiciles quite smooth and round on the inside. The frogs were much smaller than they would have been in the normal state, not more than quarter full size, and of a bright yellow colour. The rock was about fifteen feet below the ground level. Now I have an idea that the frogs are of quite recent production. Over the place where the shaft was sunk there was a pool of water last spring and it no doubt contained tadpoles, and I think they found their way, when very young, down through the fine fissures (of which there were many) in the rock until they either found, or made, the chambers they inhabited, though how they got food is a mystery. I understand that frogs can imbibe through their skins double their weight of water. Is it not possible that they may abstract a small amount of nutriment from the organic matter contained in the water? Is it not also possible that they may excrete an acid from the skin, that may have the power of dissolving the rock and so make the cavity? I have noticed that there is frequently a pool of water in quarries in the Spring, when frogs spawn, and think it more than likely that that explains the mystery belonging to the stories that are so universal about this subject. But on the other hand, it is strange that we found casts, or fossil deposits of old holes of about the same size as previously mentioned, which would seem to point to the idea of frogs having lived under similar circumstances, a great number of years ago, the holes being gradually filled up when they died. I have broken one or two through, but could find no trace of anything resembling the skeleton of a frog. Perhaps some other readers of NATURE NOTES have had experience on this subject. F. GIBBONS.

Law Bush, Brettell Lane, Stourbridge.

Locusts exterminated by Inoculation.—Can any reader give information as to this, what is the fungus employed (if it be a fungus) and how it is employed? The information is wanted for Argentina.

The Sea Buckthorn.—Here, thirty miles from the sea-coast, the plant grows well, but has not at present borne any berries. Our original plants were raised from seeds obtained at Helder, in North Holland, where it grows profusely. We have since bought both male and female plants, the sea-buckthorn being dioecious, and hope to be rewarded by it bearing its handsome orange-red berries. It berries well at Kew, and there is a good coloured plate of it in vol. xlix. of "The Garden." This journal also refers to it in its current number on page 10. I have seen it grow and berry well along the coast of Wigtownshire, where it has most probably been planted as a wind-break.

Hodden Clough, Clitheroe. G. B. MILNE-REDHEAD.

SELBORNE SOCIETY NOTICES.

Donations towards Reduction of the Deficit.—The Council acknowledges with thanks the receipt of the following donations :—R. Congreve, Esq., 2s. 6d. ; Miss Farmar, 2s. 6d.; Mrs. Gibson, 2s. 6d.; Miss Whiting, 2s. 6d. ; Mrs. Croasdaile, 1s. ; W. J. Carver, Esq., 10s. ; Mrs. Clayton, 20s. ; Rev. R. Jowett-Burton, 2s. 6d. : Mrs. Lomer, 20s. ; Mrs. Lowther, 5s. ; Miss E. Grove, 15s. ; A. J. Hearne, Esq., 5s. ; Miss Lowry, 5s. ; Mrs. R. B. Litchfield, 5s. ; C. W. Ware, Esq., 5s. ; C. Surgey, Esq., 16s. ; Miss H. C. Manson, 21s. ; G. Stanton, Esq., 3s. 6d. ; Miss M. W. Ranken, 2s. 6d. ; Miss H. C. Bickham, 5s.; Miss Forsteen, 5s. ; *Anon.*, 2s. 6d. ; Miss M. Barne, 5s.; J. Chapman, Esq., 2s. 6d.; Dr. Underwood, 5s. ; Miss E. Lecky, 2s. 6d. ; C. West, Esq., 5s. 6d. ; A Friend, 2s. 6d. ; J. E. Comrie, Esq.. C.E., 5s.

The following have increased their subscriptions :—Mrs. Brightwen to £5 5s. ; Sir J. Colquhoun, Bart., to £2 ; W. Whitwell, Esq., W. H. Warner, Esq., Miss H. C. Manson, and Miss A. Garrett, to 21s. ; Mrs. Rickaby, Miss Lomer, Miss Nicholl, and Mrs. Minet, to 20s. ; The Bishop of Durham, and Miss Hall, to 10s. 6d. ; Mrs. A. Cook (Clapton), Miss L. M. Dixon, Mrs. Hogg, W. J. Carver, Esq., Mrs. W. Greenwood, Mrs. Turle, Richardson Evans, Esq., Mrs. J. H. Crofton, Rev. A. Crofton, Miss S. L. Crofton, Mrs. Blunt, Miss E. Shadwell, Cosmo Blore, Esq., Mrs. Eden, Mrs. Asheton-Atkinson, J. U. Powell, Esq., Mrs. Kempson, H. J. Evelegh, Esq., F.W.A., Mrs. Cheetham, and Lady Simeon, to 10s. ; Miss Aentz and Miss J. C. James, to 7s. 6d. The Council have also received £5 from the Wimbledon and Putney Branch.

Council and Committee Meetings.—The next meetings of the Council will be held on Tuesdays, February 7, and March 7, at 5.30. *Special Notice.*—The Magazine and Leaflet Committee will meet on Tuesday, February 14, at 5.30, instead of on February 21, as previously announced.

Resignation of Mr. Edward A. Martin.—At the Council Meeting of December 6, Mr. Edward A. Martin tendered his resignation of the Honorary Secretaryship of the Magazine and Leaflet Committee, which was accepted with regret.

NEWS FROM THE BRANCHES.

Kensington.—The lecture to be given by the Hon. J. Scott Montagu, M.P., in aid of the fund for the reduction of the deficit, has been postponed until a later date.

Farnham.—Mr. E. A. Martin, F.G.S., gave an interesting lecture on "Birds and their Allies," in Frensham Schools, on December 13, which was very well attended by the village people and farmers. Mr. Martin also came to Farnham on December 21 for an afternoon lecture, his subject being "Gilbert White and the Village of Selborne," illustrated by photographic lantern slides.

Sutton.—The Council hears with regret of the death of Mr. R. Hill Blades, who for some years undertook the duties of Honorary Secretary of the Sutton Branch. Miss E. M. Blades will kindly carry on the duties for the present.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W. ; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 111. MARCH, 1899. Vol. X.

SELBORNIANA.

Crohamhurst.—The Selborne Society is deeply interested in securing places of sylvan beauty as permanent open spaces, especially in and around our great overgrown cities. The ever-widening sweep of the metropolis has practically joined itself on to Croydon in the south, as much as to Brentford, Acton and Ealing in the west, and, in the words of one of their own local papers, "Croydon is growing at a rate almost on a par with the growth of the mushroom cities of Western America and other virgin lands, rows and streets of houses pushing out in every direction." Just on the outskirts of this advancing sea of houses towards the south-east is the still beautiful wooded hill of Crohamhurst, with a pebbly soil refusing cultivation, but offering tempting sites to the enterprising builder of villas. The governors of the Whitgift Charity, the owners of the estate, offered to sell a portion to the Croydon County Council for the "nominal" sum of £1,000, "for the use of the public for ever;" but this apparently generous offer, accepted as it was by the Council with almost tearful expressions of gratitude, does not in the light of later events bear quite such an aspect of disinterested public spirit. Nothing was then said about converting the other part of the Hurst into a large building estate, the erection of "semi-detacheds" and, generally, the vulgarisation of as beautiful a stretch of wooded hill and dale as may be found in the whole county of Surrey. As to whether this was mere accident, or whether it was design, one can only guess, but if the public, by having given up to them for preservation at public expense, those parts of the Hurst less "desirable" for building, were induced to overlook the cutting-up of the remainder into building plots, the bargain would, one would think, have been a fairly good one, from the point of view of the owners. Fortu-

nately the public are not always so purblind as the clever people of the community seem to think. The local branch of the Selborne Society, under the leadership of their energetic secretary, Mr. E. A. Martin, F.G.S., called a public meeting on the Hurst on January 22, at which it was explained that out of the whole area of about eighty acres, the Whitgift governors have consented to sell thirty-five acres to the Corporation, while reserving the base for building purposes; that this involves cutting up some of the prettiest portions of the Hurst; and that for half a century and more, Croydonians have rambled unmolested over the Hill, so that some of the well-beaten tracks are undoubtedly public footpaths. The meeting was unanimously in favour of the purchase of the property as a whole, and an influential committee was formed to further this object. At the meeting of the County Council on February 6, however, whilst the acquisition of the thirty-five acres was agreed upon, the request of various deputations that the whole should be purchased was left in abeyance. True lovers of nature and those who value open spaces must, therefore, continue to contest this insidious attempt to use public funds to improve the property of a private building estate, and to so assist in the ruin of a beautiful bit of woodland.

Sundays as Close-time.—The Norfolk County Council has just adopted a proposal for the administration of the Wild Birds' Protection Acts, which is worth the consideration of other County authorities. The Acts fix the close time for wild birds from March 1 to August 1; but give to County Councils the power to make orders, with the approval in each case of the Home Secretary, for extending this time. This has generally been interpreted as a power of adding a few weeks in continuance of the statutory period. The Norfolk proposal is to make all Sundays close days, as they already are for game. It is on Sundays that the prowling gunner is most in evidence, especially along foreshores and in districts that can be easily reached from any considerable town.—*Westminster Gazette.*

The Trade in British Song-birds.—A few weeks back at the Lambeth County Court some sad revelations were made as to the needless suffering caused by the public demand. A bird-dealer named Charles Grimwood, of Lee, summoned Alfred Wison for £2, the price of ten dozen linnets. Wison said he could not pay, because nearly all the birds had expired. His Honour asked if they usually died, and the reply was that the close confinement killed them. The plaintiff said defendant could easily disburse: he generally bought 150 dozen a week, including linnets, skylarks, and other British song-birds. Judgment was given for the plaintiff; but Judge Emden said it was a great pity that the birds should be condemned to such a miserable life, or rather death. Obviously a bird had better be born a sparrow, or a chicken.

SPARE THE OWL.—Our correspondent, Mr. Joseph Collinson, has sent the following letter to *The Standard* :—

"May I call attention in the columns of *The Standard* to the fashion which has just decreed that the owl shall be the favourite bird for millinery purposes during the next few months? I would beg of you to lend your powerful aid to the movement which is endeavouring to shame so disgraceful a practice from the community. There is nothing more extraordinary in the century that I know of than this terribly demoralising craze among women to decorate themselves with the feathers and wings of birds ; sometimes the entire bodies and all. We are told on the very highest authority that the demand for sprays which are obtained from the birds of Paradise has been so great and so continuous that the trade now finds the supply failing. But the wholesale destruction of the harmless and necessary owl is even more deplorable—to an Englishman ; and I think it is a great pity indeed that there is no law to interfere with the liberty of the subject in this respect.

"But women are not the only offenders. The game-keeper (the fact is well known, leastways among the country people, if not by the general public) is a bitter enemy of the owl. The pole-trap, of which he is so fond, is an abominable device, and very little good will result from the efforts which are being made by the Board of Agriculture and the Bird Protection Societies to give the owl the protection that it is entitled to, while it is tolerated. It would be a waste of words to enlarge upon it as an instrument of torture. Plenty of evidence of this, some of a most revolting character, is to be found recorded in such humane journals as the *Animals' Friend*. Most of us know the description given of it by Richard Jefferies in 'Wood Magic.' As a cause of indiscriminate destruction, I believe that Mr. W. H. Hudson, who has rendered herculean service in the cause of the persecuted birds, is ready to furnish particulars to anyone who may introduce a Bill for its abolition.

"The owner is not always to blame. Some take a fairly broad view of bird life ; others again are eager to protect certain kinds. It is the gamekeeper who is at the bottom of all the mischief. Alas, that, while much has been written on the subject, little has been done. It is a matter which all who love the birds for their own sakes must have at heart."

As long as that genuine nature-lover, Mr. F. Carruthers Gould, is in authority, Selbornian principles are sure of a strong support from the *Westminster Gazette*, and we are glad to see an excellent illustration of an owl, with a poem by Mr. F. B. Doveton, bearing the same title as this paragraph, in a recent number of the *Budget*, issued from the same office.

WAS THERE NO ALTERNATIVE?—A Mr. J. H. Gartrell, of Penzance, writes to one of our contemporaries :—

"Last month a kingfisher—the first I had ever seen—became a frequent visitor to my garden, which is situated nearly in the middle of the town, and has an oval-shaped pond about 18ft. in length, in which there were about fifty goldfish. One morning at breakfast I was attracted by the brilliant colours of a strange bird perching in a tree, and intently watching the pond, and occasionally diving to the surface and picking up and gobbling something in gull-fashion, which I saw must be my goldfish. The bird was having his breakfast at the same time as myself. He came again for his dinner, and for three or four days in succession. I became anxious for my goldfish, and desperate enough to shoot the bird. I, however, did not want to injure his beautiful plumage, and used very fine shot. One of these only struck him, but it was in the eye, and that was enough. The bird is now stuffed, and for the next hundred years will, no doubt, be on view to anyone who wishes to see a kingfisher. The query is how this bird should be so clever as to find out my pond and the goldfish therein."

Well may the *Western Morning News* in commenting on this letter write :—

"The strange thing about this interesting little adventure is that the gentleman 'did not want to injure his beautiful plumage,' and so he shot him !"

Protection of Birds in Austria.—The Vienna Society for the Protection of Birds, whose seat is at Gratz, has lately drawn upon itself the wrath of the Vienna tradesmen dealing in ornamental feathers. The honorary president, Lili Lehmann, well known in Germany and Austria for her fine singing at chamber concerts, gave at the late meeting of the Society's congress at Gratz an enthusiastic address on behalf of the feathered creation, which she recommended to the protection of every right-minded person. She spoke with passionate fervour against the fashion of decorating ladies' hats with stuffed birds, and appealed to the women of Austria to emancipate themselves from this odious custom. This speech was printed, and thousands of copies distributed. The guild of feather dealers discovered in the agitation a disturbance of trade, as their profits have considerably fallen off since the appeal was published. They took counsel with a distinguished Vienna lawyer, as well as with a solicitor attached to the Commercial Museum, as to whether an action were possible against Frau Lehmann, in particular, or the Society for the Protection of Birds, in general. The answer in both cases was unfavourable. They were informed that they could no more prosecute for this than publicans could make out a case against a temperance association, or butchers against vegetarian bodies. After this unsuccessful attempt to damp their ardour, the Gratz Society has set to work with renewed vigour.—*Daily Telegraph.*

Protection of Birds in the United States.—The following is a copy of a bill passed by the United States Senate, January 6: "That the importation into the United States of birds, feathers, or parts of birds for ornamental purposes be, and the same is hereby prohibited; provided, however, that nothing herein contained shall be construed as prohibiting the importation of birds for museums, zoological gardens, or scientific collections, or the importation of living birds, or of feathers taken from living birds without injury to the bird. The Secretary of the Treasury is hereby authorised to make regulations for carrying into effect the provisions of this section. That the transportation of birds, feathers, or parts of birds, to be used or sold, from any State or Territory of the United States to or through any other State or Territory of the United States is hereby prohibited. Whoever shall violate the provisions of this section shall, upon conviction in the district where the offence shall have been committed, be punished for each such offence by a fine of 50 dols. That the sale, keeping, or offering for sale, within any Territory of the United States, or within the district

of Columbia, of birds, feathers, or parts of birds for ornamental purposes, except such as are excepted in the preceding sections of this act, be, and the same is hereby, prohibited. Whoever shall violate the provisions of this section shall, upon conviction, be punished for each offence by a fine of 50 dols."

A Defence of Barbed Wire.—Mr. R. Denny Urlin sends the following:

"A most interesting passage occurs in the current number of *Longman's Magazine* (p. 321), the author being Mr. Rider Haggard, who has large experience of country life: 'In walking in the Bath-Hills plantation this evening I observed that my plan of enclosing the hill with barbed wire is already beginning to bear fruit. I can never remember seeing or hearing so many birds about the place. In addition to all the commoner kinds, I observed a yellowish bird with the shape and general appearance of a hawfinch, with which I am quite unfamiliar; also green woodpeckers, hawks, nightjars, and I think jays, and many others.'

"This is a valuable hint for those who, like myself, believe that the nests of thrushes, blackbirds and robins are attacked by boys—nothing but barbed wire can keep these latter away. It may be objected that barbed wire is annoying to people who follow the harriers. This may be true, but my sympathies are rather with the hare, than with the men and dogs who chase this harmless and timid little animal to its destruction. I have long thought a hare-hunt a degrading spectacle."

Wild Birds and Ferns.—Mr. S. L. Petty, of Ulverston, writes: "Your note on the extermination of ferns by trade 'collectors' is a matter which affects the Lake district quite as much, if not more than, Devon and Cornwall. Lanes which a few years ago contained lady fern or hart's tongue (varieties also in some) are now as bare of them as the back of my hand. Primroses, too, are much less common on the outskirts of the district than formerly. I cannot say if this is due to the efforts of Sir G. Birdwood and the Primrose League, but it is quite likely. Why will no celebrity take a fancy to groundsel, charlock, or knapweed (*Centaurea nigra*), all of which are much too common with us. The remedy you recommend is doubtless the best, for if no buyers are forthcoming the trade is likely to decline to a large extent. But alas! we suffer more from the visitors than from the 'trade.' From Easter to Michaelmas these people are at work, and it is a very common thing to see baskets and hampers of ferns on the platforms of the stations of Keswick, Windermere, and Ulverston, most of which are put into trains going south. More vexatious still is the thought that many of these dangerous visitors of ours are, or profess to be, admirers of Wordsworth, and some are Selbornians! This is not pleasant to know. Lest it be thought I 'draw the long-bow,' I know of a case of a clergyman and Selbornian who exter-

minated *Cystopteris fragilis* in a south-west Cumberland station, and then blamed me because I knew the locality. Then is it not a fact that *Cypripedium Calceolus* was uprooted in a West Yorkshire locality by the efforts of a professor of botany at a certain University. As it is in print, and has not been denied so far as I know, it seems as if it were true. These men are unfortunately not exceptions, neither is the clerical barbarian who shot the hoopoe, further south, in Lancashire, a few years ago. The wild birds on Walney Island are now brought under the Act, and in some cases the time has been extended; this is due to the energy of a few Barrow gentlemen, and not before the case warranted their intervention."

SET OF "NATURE NOTES" FOR SALE.—A member has a complete set of the nine volumes of NATURE NOTES for sale, unbound, for 18s., or offers. Apply to the Editor.

OBSERVATIONS FOR YOUNG BOTANISTS.

III.—STEMS.

KINDS OF STEMS.—Stems may be subterranean, aquatic, or aërial, *i.e.*, on land. The differences between them are very obvious, being adaptations in structure to these three media, which have compelled them to arise. The first kind may be long and slender, growing to a great length if the soil be loose, as in sand. Several grasses and sedges are planted in sand-hills by the sea, so that they may bind the sand and prevent its being blown away. Garden mint and the lily of the valley are good examples. It is a means of spreading the plant apart from seed. The subterranean stems are perennial, while the leafy flowering shoots which arise from them are annual.

Another kind is called a rhizome, being short and thick, as that of flags; but potatoes and Jerusalem artichokes are called tubers. Their use is to multiply the plant, but as they become, in the case of the tubers at least, more or less independent of the parent, they contain a quantity of nourishment to supply the "eyes," which grow up into new plants.

That they are only branches altered in structure by growing underground may be seen by experiments. If when a potato plant has appeared above ground, one of its subterranean branches be lifted up and exposed to air and light, it will now grow into a leafy shoot, instead of forming a tuber at the end of it. Conversely, if *all* the underground shoots be removed, so that *no* tubers can be formed there, so strong is the tendency to produce them, that this may overcome the formation of leafy branches and convert them into aërial tubers all over the plant instead.

If a growing aërial branch of mint be bent down and buried, it will be found that, after it has grown for some time underground, the microscopical details of the new part at once begin to imitate the usual—but, of course, more decidedly marked—structure of an underground stem, showing that this structure solely depends upon the external conditions in which the stem grows.

Aerial Stems.—Growing erect in air they must support themselves, and it is interesting to note all the different shapes of stems of herbs, to see how Nature strengthens them to prevent their falling. Thus, several, as the carrot, are fluted externally with stiffened ridges like buttresses; others, though round, have a hardened tissue just beneath the surface and made from the pericycle, as in the wire-like flower-stem of an *Iris*, &c., or, again, a fibrous layer is formed giving great flexibility, as in flax. If it be a shrub or tree, then wood fibres are supplied in abundance.

To prove how a stem will "respond" to a strain the following experiment has been made: the stem of a seedling sunflower, which would have broken under a weight of 160 grms., bore a weight of 250 grms., after having been subjected for two days to the strain of a weight of 150 grms. The weight was subsequently increased to 400 grms. without injury. A simple experiment with leaf stalks of developing leaves in spring will show the same thing, as by suspending a given weight and subsequently comparing the tissues seen in cross sections in a normal leaf stalk, and in the one experimented on, the latter will have much more wood. From these experiments and observations, a general law may be expressed by saying that just as the muscles on the limbs of animals become strengthened by use, so is it in plants. They "feel" any extra strain put upon them, and they "respond" accordingly by adding such tissues as are requisite to meet the demand.

The principle upon which woody stems are rendered rigid is that of a combination of girders. A section of an iron girder is that of the letter I, and if a number of these are made to cross one another in the middle, such represents the arrangement of the woody bundles in a young stem. In place, however, of the connecting pieces of the I, there is a uniform mass of cellular tissue constituting the pith. In stems of a few years' growth wedges replace the more isolated packets of wood.

Aquatic Stems.—These are supported by the water. Consequently there is no necessity to supply much "mechanical tissue." Instead of this, long air-chambers run up the stem which render it light and easily to be supported by the water. If a stalk of a water-lily flower, or other water-plant, be cut clean across and touched with Indian ink, beautiful impressions can be made of these air-chambers. If a plant usually growing on land be allowed to grow in water, the submerged parts immediately form air-chambers and cease to form much wood,

showing how those features characteristic of aquatic plants can soon be brought about by the action of the surrounding conditions.

Climbing Stems.—Many plants climb up others by twisting spirally about them. This habit has probably arisen by growing in very shady places. The subdued light enables the "internodes," or portions of stem between the joints, to grow freely, and this, coupled with the universal habit of "circumnutating" or "bowing around," has resulted in their twisting round neighbouring objects. Thus the lesser convolvulus growing in a corn field climbs up the wheat stems; but if it happens to grow on a sunny bank it creeps along the ground, making no effort to climb whatever.

Many tropical climbers have woody stems, and their anatomical structure is very peculiar; but in all cases it will be observed that the details are in harmony with the conditions of growth; some, *e.g.*, being like thick ropes with many strands, supplying enormous strength. Some species of the genus *Strychnos* (to which the *nux vomica* belongs) have converted their branches into tendrils, just as the pea has altered its leaves for the same purpose. In the case of the vine and virginia creeper, it is the flowering branches which are utilised as tendrils for this purpose.

If the student will search over a vine plant he will soon perceive that a flowering branch carries a tendril at its base, and it often happens that this tendril has two or three, or more, buds upon it. Conversely, now and then a long tendril shoots out from the middle of a bunch of flowers. This shows that these two are interchangeable in structure and use. And in proportion as a tendril bears buds so does the peculiar sensitiveness to touch, which it has to enable it to clasp an object, become less and less till it is a complete flowering branch, when it has none. A plant of the old-fashioned virginia creeper (*Ampelopsis hederacea*) should be compared with the species which grows close to a wall (*A. tricuspidata*), and it would be seen that both kinds fix themselves by tendrils, not, however, by twining but by means of adhesive pads; and that while the former does not make them until contact with the wall has taken place, in the other species the pads are hereditary in that they are partially formed *before* contact.

A RED-LETTER DAY.

MOST observers of nature can look back on days, perhaps long past, when something of unusual interest has come to their notice—the sight of some animal, bird, beast, or insect, or some choice flower or plant; and, as time goes on, the very day itself becomes a landmark in the

naturalist's life, often referred to, and always recalled with pleasure. Such a day has occurred to me more than once, and of one in particular I will now speak.

It was many years ago, in the sixties, that I was living at Usk, in Monmouthshire, a favourite resort for the disciples of Isaac Walton, and a grand field for those of Gilbert White. While there I made the acquaintance of a keen old fisherman, who had settled down near the river to engage in his favourite pursuit, after having amassed a comfortable income from success in business. To his fondness for the gentle art was added a love of entomology—another great recommendation in my eyes. No wonder, then, that we often met, and spent many happy days together. They say "birds of a feather flock together," and this certainly applies to entomologists—"bug hunters," as people irreverently used to call us. How much does a companion brighten up an excursion to a distant spot in search of some particular insect we know to be just out, and which we had taken there before; or when sugaring at night in the heart, it may be, of some lonely wood! Then there is the comparing notes afterwards, and the exchanging so as to perfect the rows in the cabinet. Or perhaps some young enthusiast is taken under the old collector's wing, and taught the tricks of the trade—when and where and how to put the sugar on the trees, the likely spots to dig for pupæ, aye, and for larvæ too, how to set up business, what to look for, and what to expect, how to treat the capture when made, what flowers or plants to specially watch and search.

It was one glorious afternoon in June that my fisher friend laid aside his rod and went for a ramble, gauze net in hand, with me to a spot rather more than a mile from the town of Usk, and between it and a village called Monkswood. At first we caught but little: however on arriving at the sunny side of a wood I took a fine specimen of the black-veined white butterfly *(Pieris Cratægi)*. At the time my companion was some little distance off, but a shout soon told him what I had secured, and he was not long in coming to identify my capture; but what was his surprise and delight to find that there were many more around, not one here and there, but by the dozen. How we did race and run! I a young fellow in splendid trim, just down from the 'Varsity, and from the tented fields of Cowley and Lords; he much older and with portly waistcoat, such as I in all these years that since have passed have happily escaped. As we filled our boxes I could hear him crying out he could do no more, that an attack of apoplexy was fast supervening, and yet he persevered, as you may be sure did I. When we had taken enough and to spare, we sat down on a grassy bank to cool, and smoke the calumet of peace.

But another treat was in store for us, this time of a different kind. At a short distance from where we were reclining there was an overhanging wood with perpendicular rocks and fine old

trees, belonging to a large landowner I knew well. Presently from this wood there appeared a buzzard, which began to fly round and round in the open, almost on purpose, it would seem, for our especial benefit. He was soon joined by a second, and then another and another, till there were five in all. In circle after circle did they float, rising higher and higher in the air, as we gazed at them till it was time for us to return home. This was a sight never to be effaced from the mind of an ornithologist, and one that can hardly, if ever, be seen nowadays in England; no, not any longer, at all events, in the beautiful valley of the Usk. Little did I dream of the changes so soon to come upon the actors in that day's scene. My friend has long since passed away. The buzzards are gone, aye, and the black-veined white butterfly I fear as well. It was some years afterwards, and when I had changed my abode, that I came across the owner of the wood in which the buzzards lived. I asked about them, for I knew he cared for them, as much as I. He told me he had done all he could to preserve them, and had given particular injunctions on the subject to his keeper; but that one spring they had suddenly disappeared—he supposed from some boys having stolen their eggs. At all events he saw them no more; and I fancy they retired across the Bristol Channel, for at that particular time several of these birds were shot in some woods a few miles from Clevedon in Somersetshire, which I knew well.

The black-veined white has become very rare, and is seldom taken nowadays. In last August number of NATURE NOTES I find Mr. W. F. Kirby tells us that "many species of insects are much reduced in numbers by the operation of the Wild Birds Protection Act, for most of the birds which fall under its operation are more or less exclusively insect eaters, and I think it probable that the disappearance of the black-veined white butterfly from Britain is due chiefly to this cause." With this conclusion I humbly venture to disagree. May it not rather be owing to creatures far smaller and more deadly than any migratory bird getting the upper hand, creatures which we know are enemies of many British butterflies, and especially of the kinds so closely allied to *P. Cratægi*—of the common white butterflies, and the pretty little orange-tip as well? Who has not seen, and perhaps ignorantly destroyed, the silky golden-looking pupæ cases of an ichneumon fly (*Microgaster glomeratus*), lying in clusters here and there in odd places in our gardens, in a crevice of the wall, or above the wood-work of the garden door? These, to the number of sixty or seventy, have lived on a single caterpillar of the white butterfly (*P. brassicæ*) that commits so much havoc amongst our cabbages. Should the caterpillar escape the microgaster and safely become a pupa there is another enemy in store for it before it becomes a perfect insect; for an equally small ichneumon fly (*Pteromalus brassicæ*) lays its eggs upon the chrysalis, which soon cause

death. Even the eggs of the butterfly are not exempt from foes. They are liable to the attacks of parasites, for a very minute ichneumon fly (*Teleas elatiæ*) looks upon them as "suitable abodes for its future progeny." Then the perfect insect is largely preyed upon by wasps. So that in all four stages of its existence the common cabbage-butterfly is subject to the attacks of such deadly enemies that scarcely one in a hundred successfully runs the gauntlet, and lives to propagate its species. This seems to me to be the most probable cause of the disappearance of the black-veined white.

When one sees interesting and familiar forms thus vanishing before one's eyes the question seems to arise, what will be the next creature to follow in the steps of the great auk or large copper butterfly, and, like them, cease to exist?

Market Weston, Thetford. EDMUND THOS. DAUBENY.

A NATIONAL SANCTUARY: WHAT WOLMER FOREST IS DOING FOR OUR BIRD LIFE.

(*Reprinted by permission from the "Daily Mail."*)

THE recent slaughter of kingfishers at Bath, as recorded in the *Daily Mail*, for the crime of devouring some common gold fish, has again drawn attention to the importance of sanctuaries in which birds may be safe from their many persecutors; and the following particulars respecting Wolmer Forest, which, by the recent exertions of the Guildford Society, has been secured for this purpose, may be of interest to naturalists wherever located.

Wolmer undoubtedly owes its celebrity to the description of it by Gilbert White in his delightful Natural History of Selborne, otherwise it would have gained no more notoriety than many other districts in Surrey and Hampshire, with the natural features of which it has much in common. In Gilbert White's time it was a mere undulating sandy waste, covered for the most part with gorse, ling and fern, "without," as he says, "having one standing tree in the whole extent." A distinguishing feature of it, however, was and still is, the existence of bogs or swamps in its hollows. These, produced partly by soakage from the hills, and partly by the overflow in rainy weather of certain watercourses, are impassable in some places to man or beast, and they yield from time to time fossil trees, some being black and heavy, resembling oak, while others, lighter in hue, are supposed to be pine or willow. The presence of these trunks would suggest that formerly a forest existed here, and this is believed to have been the case.

It is supposed that Wolmer formerly was included in the vast extent of woody country termed Anderida, which once

covered large portions of Surrey, Sussex and Hampshire, though at what period this district became denuded of timber there is no evidence to show. All that we certainly know is that Wolmer, like other forests, belonged to the Crown, that its condition in the early part of the last century answered to Gilbert White's description, and that it was then noted for a fine herd of red deer, which Queen Anne inspected on her journey to Portsmouth, the bank on which she sat while the animals, 500 in number, were driven before her being still traditionally pointed out as "the Queen's seat." Poaching, however, thinned the herd, and the remainder were transferred to Windsor.

As the district in Gilbert White's time was destitute of trees and cover, bird life was necessarily restricted as regards variety of species. He only enumerates wild fowl, partridges and pheasants: blackgame, he laments, had become, within his remembrance, extinct, the cause assigned by him being, curiously enough, the sporting innovation of "shooting flying." In olden times gunners preferred, when possible, shooting winged game on the ground, a curious illustration of which is seen in the large landscape by Rubens in the National Gallery, where a sporstman in the foreground, partially screened by some briars and carefully holding back a dog, is stealthily stalking a covey of partridges innocently sunning and preening themselves in the open space beyond. A native of Wolmer whose faculties, although he has passed his eightieth year, are still good, informs me that the enclosures and plantations on the higher ground were commenced by Government about the year 1825, an event fixed in his memory by the fact of his relations being employed in the work. Prior to that time, he says, he distinctly recollects that the district exactly answered to Gilbert White's description of it, namely—treeless, boggy, and covered with gorse, fern and heather.

The plantations, consisting almost wholly of Scotch fir, are mainly confined to the higher portions of the ground, the more level parts remaining in their original condition, save that here and there a few birch trees now impart a little variety to the scene.

Some change, however, has been wrought in the swampy districts by the plantations on the heights. The fir tribe notoriously absorb more atmospheric moisture than other trees: they are, therefore, of especial service in swampy, or malarious districts, a well-known example of this being the famed pine forest in the pestilential environs of Ravenna; and one result of planting in Wolmer has been to diminish the extent of the bogs. Another change, however, can scarcely be considered so advantageous. A feature of the district on which Gilbert White lovingly dilates, and which undoubtedly imparted great interest to the locality, is a pond of unusual extent, its circumference being one mile and a half, and on this we are told vast flocks of

wild fowl might be seen in the winter, while in summer it was brightened by picturesque groups of cattle standing knee-deep in the clear water.

But these, unfortunately, are things of the past. This pond is fed entirely by soakage from the higher ground, which, being now in great measure intercepted by the fir plantations, causes it not unfrequently to become quite dry in summer, while even in winter the bed of it is but imperfectly covered. An impression prevails, I find, in some quarters that this is caused by leakage in the bed of the pond, owing, it is asserted, to large quantities of gravel having been taken from it in order to form a road which some sixty years ago was made from Peterstield to Farnham through the forest ; but this is, undoubtedly, an error. On referring the matter to my venerable acquaintance he assured me that no material of any kind was taken from the pond, that he was employed at the time to superintend the making of that portion of the road, and that all the gravel used was carted from some pits quite half a mile distance from the water. Fortunately, there are several other ponds in the forest, which, being supplied by springs, are constantly full, and these, together with small brooks, still attract wild fowl in considerable numbers.

Thus it is evident that Wolmer combines in an eminent degree the natural conditions desirable in a sanctuary for birds and wild creatures. Although it has been somewhat curtailed in extent since Gilbert White's time, when it was seven miles in length by two miles and a half in breadth, it still comprises a large area of land almost valueless for agriculture, and the fir woods now afford admirable shelter for many kinds of birds which could not exist on a bare heath. Moreover, all pasturage and other rights formerly enjoyed by farmers and cottagers in the neighbourhood have been compounded for, so that the Department of Woods and Forests and the War Office have now, jointly, absolute control over the whole district, and vagrant trespassing is not permitted. The importance of this is obvious. Were tramps, bird-catchers, gipsies, and poachers allowed free access, not only might some parts of the forest become unsafe, but the extermination of bird life and the destruction of all beautiful natural objects would be speedily and certainly accomplished.

In petitioning the Government for the perpetual preservation of this district in its present state as a sanctuary for birds, and as a national memorial of England's greatest outdoor naturalist, Gilbert White, all existing conditions had, by the Guildford Society, to be taken into consideration. Manifestly it would have been extremely injudicious to attempt to interfere with the present tenure of Wolmer by the War Office, as this department not only owns some portions of it outright, but holds the remainder on lease until the year 1910. The petition, then, expressly stated that no interference with the rights of the War Office was desired, and, this being understood, the result of the

application may be regarded as entirely satisfactory. The replies from the Department of Woods and from the War Office expressed complete sympathy with the aims of the petitioners, but these authorities also stated their belief that the only way in which successful conservation of the forest could be carried out was by continuing the present system of supervision. This is now exercised by warders appointed by the War Office. These officials are not in the ordinary sense gamekeepers, inasmuch as they are not allowed to shoot, but they guard the forest against unlawful or mischievous trespassers, while they allow the use of it to those who may wish to explore it for observation or study.

Still, shooting to a limited extent is indulged in by the members (officers solely) of the Aldershot Game Preserving Association, who rear annually a small number of pheasants in the woods, and confine their sport strictly to game. But neither this nor the military manœuvres, which occasionally take place here, appears to affect the birds in the forest, for they are described by competent observers as not only numerous but singularly tame.

Thus those interesting and beautiful forest birds, the woodpeckers, are fairly abundant. A heronry, comprising some fifty nests, has been established in some of the taller trees, and the singular jarring note of the fern owl is, on a summer evening, frequently heard. Indeed, it is estimated by an ornithologist of repute that some thirty species now breed in the forest, and, with time, this number will doubtless increase. It is a matter of complaint with those supervising the forest that when certain birds, especially hawks and owls, stray beyond its precincts they are liable to be shot by gamekeepers and others on the lands adjoining; but with the spread of a knowledge of natural history will be a corresponding desire to preserve interesting examples of it. Besides, even at the present time the wish for destruction is by no means universal. A keeper employed for many years by the late Lord Selborne, whose estate joins the forest, informs me that no hawks, owls, or rare birds were allowed to be shot; and a gentleman who has recently taken on lease a large property in the neighbourhood writes me, "My keeper has strict orders to shoot neither hawks nor owls, as I am convinced they do my game no injury."

Strange to say disappointment has been expressed in some quarters that an unconditional gift of the forest for natural history purposes was not made to the Guildford Society by the Government; but this can only have arisen from very imperfect knowledge of the circumstances. No private society could competently deal with a white elephant of this kind, nor is it to be expected that the Government would, for such a purpose, cancel an existing agreement with the War Office. As it is, naturalists have obtained all that they can reasonably expect or desire—namely, an assurance from the authorities that birds of

all descriptions are rigidly preserved in the forest, coupled with a guarantee that this protection shall be carefully exercised in the future.

THOMAS WHITBURN.
(*President of the Natural History and Microscopical Society, Guildford.*)

NOTES ON LONDON BIRDS IN 1898.

MY notes on London Birds for last year contain nothing so interesting as the appearance of the nightingale in Lincoln's Inn to which I referred in 1897. For once in a way the thrushes in Kensington Gardens did not sing on New Year's Day: they were very quiet until January 5. On this day I noticed a hen yellowhammer close to the bridge over the Serpentine. The yellowhammer is on the whole very sedentary in its habits, and its occurrences in the middle of London are extremely rare, although it is a very common species in the neighbouring country. I expect the missel thrush nested in Kensington Gardens or Hyde Park, but cannot be sure. I heard its song on several occasions.

The appearances of the black-headed gull in town are now too common to attract much attention. From November to the middle of March they are to be seen almost daily in our parks. On February 24, some of these birds were hovering over the trees on the island in the Serpentine and apparently trying to pick off the young buds. They made various attempts to perch on the branches, but they were too slender, and though some managed to balance themselves for a short time it was only by aid of an occasional flap of the wings. The inclination of this species to perch on the trees in St. James's Park was the subject of a letter in the *Times* of December 24 last, by Mr. Digby Pigott. The habit is quite well known and is not confined to the black-headed gull, for Bonaparte's gull nests in trees and the herring gull occasionally does so.

On February 24, a blackbird was singing near the Row: this was the first I heard. When bicycling round Battersea Park before breakfast on the morning of Sunday, March 6, I saw a blackbird which was nearly quite white. I was told the bird had been observed there throughout the winter (see the *Field*, March 12, 1898). A chaffinch was in full song in a tree overhanging the Zoological Gardens on March 4.

It is always interesting to see how the crows fare in the nesting season owing to the persecution to which they have been subjected at the hands of the authorities. I am thankful to say that there were two nests in Kensington Gardens occupied in April last, and it is to be hoped that some young birds were reared. April is the most interesting month for

the London ornithologist, for in April the spring migrants pass through town. My sister saw a wheatear on the east side of the Serpentine on the 6th: the redstart was observed in Kensington Gardens on the 16th, the swallow on the 12th; and the willow wren was singing there on the 20th. A reed warbler was singing by the Long Water on April 25th; and several sand martins were flying over it on the 26th.

On May 3, my sister saw a blackcap in Kensington Gardens: on the 6th the spotted flycatchers arrived; and on the 14th I saw a swift flying over the Serpentine. About the middle of May a lesser whitethroat took up his abode close to the Serpentine bridge in a small but thick shrubbery, and he remained there, singing frequently, for several days, after which he suddenly disappeared.

I believe that four pairs of spotted flycatchers nested in Hyde Park and Kensington Gardens last summer. One pair caused me considerable perplexity. I saw the old birds daily not very far from Hyde Park Corner, but could not find their nest. At last, on July 26, I discovered it in a most conspicuous position not more than eight feet from the ground in a tree under which thousands of people must have been walking every day. It contained four fully fledged young. The next day all the young had disappeared but one, and it was lying on the ground at the foot of the tree, dead but still warm. I did not again pass the tree in question until the 29th, when I noticed that the nest had disappeared. A few yards from the tree, however, was a boy with a barrow filled with weeds and rubbish, and in the barrow were the remains of the flycatchers' nest which the boy said he had found lying at the foot of the tree from which I had just noticed that the nest was missing. On close examination the nest proved to be made to a great extent of the remains of wax vestas, which lie in hundreds on the paths near Hyde Park Corner; and it also contained the paper of two cigarette ends, and some long threads of coloured silk. I took the remains of the nest away with me. Whether the other young flycatchers survived I do not know; but on August 6, I saw a party of five near the Speke Monument in Kensington Gardens, and three of them were from their plumage clearly young birds.

On August 3, I noticed a willow wren by the Serpentine. On the 7th it rained hard until about five in the afternoon, when the sky cleared, and the evening became most beautiful. At half-past five I sauntered to the Round Pond, and found six or seven sand-martins and about a dozen swifts flying over the water.

Friday, August 12, was a hot day, and the night seemed even hotter. It was one of those nights on which it is quite hopeless to think of ever going to sleep. At about one hour after midnight, as I lay awake, my ears suddenly caught the sound of the call notes of a party of ringed plover passing overhead. I flew to the window and gazed upwards, but of course

could see no birds, though the notes were unmistakable. This is the only time I have heard the ringed plover in London. It has always been one of my favourite birds. It is hard to explain why we should like one species of bird more than another. But the note of the ringed plover is delicious; and this has certainly a good deal to do with it. Our likes and dislikes for our fellow human beings depend to a very great extent upon the tone of voice in which they speak to us.

On August 16, I saw a whitethroat in Kensington Gardens, and also noticed that some moorhens had built quite a large nest on a floating board near the Island in the Serpentine. On the 18th, I saw another whitethroat and a willow wren in the Gardens; and shortly after this, when the temperature had rendered life in London intolerable, I left and bicycled through Brittany.

Since my return Kensington Gardens and Hyde Park have not presented anything interesting in the way of birds beyond a dabchick which was swimming about near the Island on October 25. Perhaps it was one of the birds which are seen so regularly in St. James's Park.

It is rather disappointing to find that I have no notes for 1898 relating to the brown owl, for this species was seen and heard pretty frequently in the neighbourhood of Kensington Gardens and Campden Hill in 1897. If the birds still frequent the district, it is strange that I have heard nothing of them by night, for their habits are almost as nocturnal as my own.

Gloucester Terrace, Hyde Park, W. A. HOLTE MACPHERSON.
January 13, 1899.

NATURAL HISTORY NOTES AND QUERIES.

Pets and Consumption.—Professor Symes Thompson, in a recent lecture at Gresham College, stated that rats, dogs, cats, and cage-birds, all conveyed to us the seeds of tuberculosis—cage-birds especially nursing the seeds of cancer and consumption.

Squirrel.—We have two squirrels in our garden sufficiently tame to come to boxes supplied with Barcelona nuts set for them on the steps of two French windows. About six or seven feet above these boxes, cocoa-nuts are fastened in the wired walls for the tits. To-day one of the squirrels climbed up the wire as far as one of the cocoa-nuts, which is placed to hang downwards to prevent sparrows getting to it, put its head in at the opening and ate some of the nut. This is the first time a squirrel has been noticed doing this, so I send this account wondering if any of your readers having experience of squirrels' habits, have ever noticed this done. (Mrs.) RANDLES.
Bryn An, of Wrexham.

Frogs and Toads.—For fifteen or sixteen years I have watched the habits of a number of frogs in a fountain basin, and as far as my observation goes, I have never seen them come to the surface of the water during three or four of the winter months, except on one or two occasions, when the weather was unusually mild. They mate very early (beginning of December), and continue attached till the spawning season is over, about the third week in March. Occasionally they move about at the bottom of the water, but unless disturbed are so like the mud, a casual observer would not know there were living creatures there. I notice they do not breed till five years old, and as I destroy the spawn,

it puzzles me to know how long they live, or where they all come from. They have instinct to find their way about as far as 300 feet from the water during the summer evenings, when in pursuit of food, but always return, and keep near the pond as the evenings draw in. Toads have not bred in my garden, and do not hybernate in water, but under rock work where sheltered from cold. A splendid specimen was taking his walk abroad on a warm day in December last, and returned to his hiding place as knowingly as if used to it.

Anerley. A. J. POWELL.

[We have received several other letters to this effect. ED. *N. N.*]

The Mild Winter.—Perhaps rose growers who are Selbornians may be interested to hear that I cut roses, "La France," on December 1, and "Jules Finger" on the 6th, 1898, and, to my surprise, a "Grace Darling" on January 21, 1899. NEVILLE GREEN.

Rosslyn House, North Road, Highgate, N.

Wood Pigeon.—A neighbouring observer sends me the following memo:—"December 11, 1898, saw an old wood pigeon feeding a young one on the beech tree on the lawn. A queer thing!" EDMUND THOS. DAUBENY.

Rare Birds Shot near London.—In NATURE NOTES for January, 1899, I observe that you quote a paragraph from the *Daily Mail* under the above heading. It may be interesting to the ornithological readers of the magazine to know that the oyster-catcher is abundantly met with on the rocky shores of Britain, and in certain districts is among the commonest of the shore birds. Instead of only one species of this bird, which the paragraph you quote implies to exist universally, there are no fewer than ten distinct species, and one an aberrant form, inhabiting various portions of the globe. The name of this bird is entirely misleading as regards its feeding upon the oyster, for it is improbable that it ever attempts to eat this bivalve. It does, however, eat limpets, all kinds of small molluscs and crustaceans, mussels, small fish, and animal *débris* washed up by the tide. From what they will devour with evident relish in confinement, it is highly probable that any carrion cast up by the sea would be readily eaten by these birds. Regarding the scoter mentioned in the same paragraph, which is evidently the common scoter, there is nothing remarkable in its occurrence so near the coast, as in very stormy weather it frequently takes shelter on inland waters, and it is one of the most abundant species of duck to be met with on the eastern coast in winter. Large areas of the North Sea are at times blackened by their numbers. F. W. FROHAWK.

Zoological Society, Brighton.

Mimicry by a Starling.—The following instance of natural mimicry in bird song may be of interest to readers of NATURE NOTES. On December 26, 1898, while staying near Liverpool, I was walking round some ponds, originally red sand-stone quarries, which are stocked with a great many different kinds of duck, and I heard a starling, which was singing lustily in spite of a tremendous westerly gale, *exactly* reproduce the whistle of the Chilian pintail duck. This, as you know, is totally different to the ordinary whistle of a starling, being a short, rather husky whistle, with a break in the middle, which gives it the sound of a double note. The reproduction was perfect, and the starling repeated it several times as though he were practising and trying to better it.

MARGARET L. ANDERSON.

Bearded Tit in Norfolk.—A pleasant piece of natural history gossip comes to us from Norfolk. A certain landowner, who happens to be very wealthy and at the same time an enthusiastic ornithologist, last year had no fewer than seven nests of that rare and exquisite little bird, the bearded tit, on his estate. So delighted was he that he purchased six hundred acres of adjoining land that appeared likely to be haunted by the same species. Those who love the Broads owe a debt of gratitude to anyone who is striving to preserve the most graceful inhabitant of the reeds, threatened, as it long has been, with extinction by drainage and collectors.

Bullfinches.—In reply to Mrs. Helen Watney, on page 38, I beg most respectfully to inform her and others, who believe that bullfinches only attack such fruit buds as contain either grubs or insects or their eggs, that it is a very

erroneous idea, however we might wish it were so. I have proved this in all ways, in cages, and by watching them most intently for many years at their destructive work, and also by shooting them and turning out the contents of their stomachs, and I found only the best buds—or rather the embryo blooms—and the tiny fruits. One year I thought my bloom too forward for destruction, as it was *fully expanded*, when I turned out nearly a score of bullfinches that I had caught during the previous winter, and, to my astonishment, they cleared off thousands of blooms by biting off the flowers at the base and taking just the embryo fruit. I have also watched sparrows do so. They will pick out the greengage buds from any other sorts of fruits. A few days ago a friend (Mr. Hubert Gregory) was with me in my garden when I pointed out a pair of bullfinches (most of them pair in January) on a greengage tree feasting away. I said, "Now watch them when I drive them, and they will pass all other kinds to the next greengage tree," which was thirty or forty yards off; and they did so. I said, "Now I will drive them again, and they will fly across the orchard seventy or eighty yards to another greengage;" and they did so, as hundreds of their kind have done for many years past, as if by instinct.

The Wren's Nest, Astwood Bank, near Redditch. J. Ham.

Gulls in a Garden.—At the beginning of February the weather was frosty, which turned to sleet and snow: this brought flocks of gulls and shore feeders inland. Many years ago a stray gull or two visited a garden in Ulverston, some two miles from the shore. The inhabitant of the house fed them whenever they came. After his death the next tenant of the house fed them occasionally, and this season, after February 1, each day for a week the garden has been full of them. They never appear except in very bad weather in winter, and do not visit neighbouring gardens. What seems curious is that they are all the common gull, *Larus canus L.*, the black-headed gull not having been seen there.

Ulverston. S. L. P.

SELBORNE SOCIETY NOTICES.

Donations towards the Reduction of the Deficit.—The Council acknowledges with thanks the receipt of the following donations:—Mrs. Giberne, 20s.; Miss J. Brand, 10s.; Miss E. Brand, 10s.; Rev. A. L. Hussey, £4 4s.; Rev. H. C. Pigou, 5s.; Admiral Robertson-Macdonald, 2s. 6d.; Dr. J. C. Thorowgood, 5s.; E. A. Elliott, Esq., 5s.; Neville Green, Esq., 2s.; Miss de Winton, 10s. 6d.; "A Bullfinch," 2s.; F. Downing, Esq., 20s.; Mrs. R. F. Sturge, 2s. 6d.; Miss Marshall, 10s.; Earl of Stamford, £2; Northern Heights Branch, £1 5s.

The following have increased their subscriptions:—Rev. A. L. Hussey to 21s.; C. Leeson Prince, Esq., and Mrs. Silkenstadt to 20s.; Miss de Winton to 10s. 6d.; Miss H. M. Dods, Miss J. Brand, Miss E. Brand, Mrs. Jones, R. M. Otter-Barry, Esq., Miss Ormerod, Ernest Parke, Esq., Miss Marshall, and J. H. Master, Esq., to 10s.; W. E. Milne-Redhead, Esq., to 7s. 6d.

Council and Committee Meetings:—The next meetings of the Council will be held on Tuesdays, March 7 and April 4, at 5.30. The Magazine and Leaflet Committee will meet on Tuesday, March 14 and April 18.

National Photographic Record.—At the request of the Council, Mr. R. Marshman Wattson has consented to attend the preliminary meeting called by Sir Benjamin Stone, M.P., of representatives of societies interested in the movement to procure photographs of buildings of historical and architectural interest.

Nether Hall Gateway, Roydon.—A small committee has been formed to consider the best means of repairing this fine specimen of Tudor architecture. The Council has appointed Mr. J. E. Comrie, C.E., to represent the Selborne Society.

Proposed New Branch at Sale, Manchester.—On Monday, January 16 a lecture was given at Sale, Manchester, by Dr. Graham Renshaw, on Birds

of Paradise. The lecture was fully illustrated by lantern views, and also by specimens kindly lent by the authorities of the Manchester Museum. The lecture commenced with a brief consideration of the relationships and classification of the *Paradiseidæ*, and then a considerable number of species was described in order. The twelve-wired bird of paradise and its habits in captivity first occupied attention. The magnificent accessory plumage of D'Albertis's bird of paradise was next considered. The Rifle Birds comprised several species, of which one, the paradise rifle bird, was selected for special description. Among the short-billed species the well-known great emerald bird of paradise claimed special attention, and the cruel and insane folly of wearing birds in women's hats was strongly condemned. (This was well supported by the audience.) The chief ornament of the king bird of paradise was the curious pair of green button-like feathers adorning the tail. In Wilson's bird of paradise the most remarkable feature was the bare scalp of a brilliant blue colour. The tail had two strange curved feathers of a steely blue, whereas the closely allied golden-winged bird of paradise had these tail feathers in the form of two long green wires. The golden bird of paradise exhibited a striking difference in the two sexes, the male with his brilliant orange mantle being totally unlike his dull-coloured mate. The silvery crest, the metallic gorget and six plumes of the six-shafted bird of paradise and the fan-like crests of the superb bird of paradise were also fully described. In the gorget bird of paradise some of the feathers were fiery gold in some lights. The claims and objects of the Selborne Society were fully laid before a large and appreciative audience, and the Society's magazines and pamphlets read with interest.

At a meeting held on January 30, it was resolved to hold an exhibition of natural history objects at an early date, and then to hold a second meeting during the exhibition, with a view to securing a first committee of gentlemen, who would sign a petition asking the Society to permit the formation of a branch in the district.

Additions to the Selborne Library.—The Librarian reports that the following books have been received from the Editor, and are hereby acknowledged with thanks: "The Wanton Mutilation of Animals," by Dr. George Fleming; "The Structure and Classification of Birds," by F. E. Beddard; "Humane Science Lectures."

NEWS FROM THE BRANCHES.

Clapton.—On January 21, Mr. J. D. Hardy, F.G.S., gave a very instructive paper on "The Moon" which he illustrated by diagrams and a series of excellent photographs.

Prof. G. S. Boulger, F.L.S., F.G.S., was the lecturer at the monthly winter meeting held on February 18, when the subject of "London Trees" proved of great interest to the members and friends of this suburban branch.

The annual meeting for the election of officers, &c., will be held at the North East London Institute on March 18 at 7.30, being the ordinary meeting.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 112. APRIL, 1899. Vol. X.

SELBORNIANA.

Something Done.—On March 6, Sir John Lubbock asked the Under Secretary for War whether the use of aigrettes in the Army had been abandoned, in accordance with the promise given last Session; and Mr. Wyndham replied that a new plume, not made from the feathers of the egret, has been provided.

The Hurst, the whole Hurst, and nothing but the Hurst.—We are glad to see that public opinion in Croydon seems to be roused in favour of the preservation of Crohamhurst from the builder. At a mass meeting on March 10 it was unanimously resolved:—(1) "That this meeting is strongly in favour of the acquisition of the whole of Crohamhurst for the people for ever; and pledges itself to use every endeavour to attain that object." (2) "That this meeting hopes that, if it is not within the power of the Whitgift Governors to present the Hurst as a free gift to the town, they will name such a moderate price for it as will enable the Croydon County Council to acquire it." We announce on the last page of the present number a ramble, including the Hurst, under the auspices of the Croydon branch.

The River Thames: its Preservation for Public Recreation.—A Conference of representatives appointed by various national and local societies, interested in the preservation of the Thames and its valley for the public enjoyment, took place recently at the offices of the Commons Preservation Society. The organisations represented were:—The Commons Preservation Society and its Committees for Kent and Surrey, and Middlesex, Herts and Bucks; the Berks, South Oxon and North Hants Society; The National Footpath Preservation Society; and the National Trust for Places of Historic Interest or Natural Beauty. The Right Hon. G. J. Shaw-Lefevre presided.

Sir Robert Hunter stated that the Conference had been called with a view to the organisation of a special Committee representative of the many societies interested in preserving not only the amenities of the Thames Valley, but also the rights of the public with respect to the ferries, towing paths, landing places, backwaters, buildings, and other features of beauty and interest in or adjacent to the river. He moved the following resolution :—"That it is desirable that a special Committee be formed for the protection of the Thames and its tributaries and their preservation as places of recreation for the nation."

Sir Charles Dilke, Bart, M.P., spoke favourably of much of the work accomplished by the Conservancy in the lower reaches of the river. They had also done much to preserve the water-lilies which were such an attraction, and which had until latterly been subject to great depredations on the part of professional gatherers. He would be glad to assist in carrying out the aims of the Committee.

Mr. C. H. Cook ("John Bickerdyke") expressed his regret that the power of purchasing land for public purposes, which the Conservators had possessed for upwards of a century, had been relinquished by the Thames Preservation (Consolidation) Act of 1894.

Mr. Richardson Evans referred to the detrimental effect exerted upon the scenery of the Thames by modern advertising methods. The following gentlemen were appointed a Sub-Committee to draw up rules to be submitted to the various constituent societies:—Sir Robert Hunter, Mr. Percival Birkett, Mr. F. C. Channing, Mr. G. G. T. Treherne, and Mr. C. H. Cook.

Sutton Park a "Sanctuary." — The crested grebe which Mr. Genders shot in Sutton Park about twelve months ago will have a lasting memorial if a proposal which Mr. C. E. Mathews is putting forward is carried into effect. It was Mr. Mathews who called public attention to the slaughter of the grebe and the short-eared owl twelve months ago, and as a consequence of the agitation then raised the Town Council of Sutton Coldfield withdrew the shooting licenses which had hitherto been in force. Speaking at a "kindness to animals" meeting, Mr. Mathews stated that the change which had come over Sutton Park in twelve months was really wonderful. Wild life of all kinds now abounded there—heron, grebe, widgeon, pheasants, and hares, and the place had become a perfect sanctuary for fur and feather. He wanted the Corporation of Sutton Coldfield to take steps to ensure that there should be no interference with the wild life of the park in the future, and he sincerely hoped that the Corporation would not require pressure to be brought on them to make them take this step. But if pressure were required, Mr. Mathews said, he should ask every man and woman present at that meeting to support him. The Dean of Hereford said that he was very

glad to hear Mr. Mathews' announcement, and expressed his hope that what Mr. Mathews had foreshadowed might come to pass.—*Birmingham Argus.*

African Big Game.—We are glad to see that this subject is attracting attention both in and out of Parliament. We hope to deal with it in our next number, so much of our space this month being occupied by New Forest matters.

Humanitarian League.—In response to a request expressed by several members, and in order to afford an opportunity for the supporters of the Humanitarian League to become better acquainted, it is proposed by the Executive Committee to give an "At Home" at St. Martin's Town Hall, on the evening of Tuesday, April 18, the day on which the Annual Business Meeting will be held. As it is important to cover expenses, it is proposed to issue tickets at one shilling each, which will include refreshments.

Primrose Day.—A correspondent writes:—"As a member of the Selborne Society I have been sorry to read frequent complaints as to the raiding of woods near London for primroses previous to April 19, and I have been wondering if steps could not be taken to promote the use of artificial primroses, which certainly possess the advantage of not fading. The Flower Girls Christian Mission supply well-made primroses at very moderate price, and if Conservatives could be urged to send orders for button-holes, &c., to the Secretary, Mr. Groom, 8, Sekforde Street, Clerkenwell, E.C., they would be helping a very good work, and also aid in some small measure to check the increasing robbery of our woods of one of their chief spring beauties."

A Humane Monarch.—Perhaps the most salient feature in the character of the Czar is his aversion to the needless slaughter of animals of any kind. He has recently forsworn the pleasures of the chase and the shooting of game, and since his suite, from motives of policy at any rate, refrain from indulging in this pastime, the beasts and birds in the Imperial demesnes live in undisturbed quiet.—*Daily Mail.*

IN THE NEW FOREST—SQUIRRELS AT PLAY.

T was on one of those glorious September mornings of the past autumn that I left Southampton by an early train for Brockenhurst for the purpose of spending the remainder of the day in the New Forest. It was a new impression, the locality having all the charm of novelty and freshness from the fact of my never having set a foot on it before. The long stretch of moorland that has to be crossed before entering upon the woodlands or forest proper, with its

scant herbage, bracken, heather, and groups of shaggy ponies and cattle ranging at will, with no apparent fence or barrier to prevent their wandering nearly to the Isle of Wight, acts as a foil and offers a sharp contrast to the sylvan solitudes to be found further on. The village of Brockenhurst affords a pleasant resting place, with its one or two picturesque old inns gabled and ivy-grown, village green and rural surroundings. One cottage was a perfect bower of greenery and blossom; a dense growth of wild clematis had taken complete possession of it and hung in trailing festoons from the ridge piece to the ground. The clematis was in full bloom, and presented a charming picture. Whilst I was admiring this cottage I could hear in the distance a patter of many feet, ripples of laughter and joyous talk. Presently, in a bend of the walk, I caught a glint of a flag at the head of a long procession of boys and girls, as they came in a living stream of ever-changing colour and motion, white, scarlet, blue, crimson, and orange intermingling in kaleidoscopic confusion. It reminded one of the children following "The Pied Piper of Hamelin:"

> All the little boys and girls,
> With rosy cheeks and flaxen curls,
> And sparkling eyes, and teeth like pearls,
> Tripping and skipping, ran merrily after
> The wonderful music with shouts and laughter.

But not in this case to enter the enchanted regions through Koppelbery Hill, but to spend a holiday in the forest. Following in their wake in the direction of Lyndhurst, I soon found an opportunity of leaving the high road for the forest. The first living thing I saw in it was a weasel, and a little further on the inevitable gipsies turned up, a tiny column of smoke curling above the trees betraying their presence. Black-haired, tawny slips of girls, with battered straw-hats, shoeless feet, a strip of red shawl crossed over their shoulders and brought round the waist, in long-drawn plaintive tones begged for a copper. There must be some innate artistic instinct to guide these picturesque nomads in the selection of colours. What can be more telling as an accompaniment to that swarthy brunette complexion than that bit of red colouring in the shawl and the string of blue-and-white beads on the brown neck? The old white horse, the dingy canvas tent, the ramshackle cart, are all in keeping. As interesting adjuncts to our lanes and woodlands who would like to banish them? A little further on I came on a tinker pitching his tent. A cheery soul seemed this tinker, with his household gods all around him, his children at play on a patch of green-sward under his eye, his wheel painted a bright-green standing hard by ready for any amount of grinding, his house water-tight and cosy, with no tiresome stairs to climb, a house that can be shifted in twenty minutes and transported to any charming site he may take a fancy to for many a mile round. No

rent, no taxes, no nuisance man sniffing at the drains, no organ-grinder to call at the door—with plenty of work and ready money coming in, constant change of scene, and a bank of good health to draw on, if our tinker is not a happy man, why then he ought to be one. Leaving the tinker behind, and getting further into the forest, the trees began to assume grander proportions, and here at last is one of the monarchs—a grand old oak, mighty in trunk and gigantic in limb, arms as large as a medium-sized tree, and covering a space of ground large enough to shelter a small regiment of soldiers. From its apparent age this tree, by joining hands with its sire, might stretch back to the days of the Red King, when the forest was young, saplings abounded, and the giants of hereafter were slim youths wanting a few centuries to complete their growth. It being a warm afternoon, I lay down to rest under the shade of this brave old oak. I supposed I must have dozed, for I started up on hearing a slight noise overhead and something fall to the ground. On looking up I saw it was a squirrel in one of the branches. Being anxious to watch its movements, I remained perfectly still. After jumping airily about from one branch to another he approached near to where I was lying, and at last, curiosity getting the better of fear, he ventured on to the limb just over my head. I now feigned sleep, knowing that neither bird nor wild animal like being stared at. With ears erect and the brightest of black eyes he looked archly and wonderingly clever at me. He was so close I could have touched him with my stick. Finding there was nothing to dread he became quite fearless, and played about in the branches with the greatest *abandon*. Presently No. 1 squirrel was joined by No. 2; and then began a game of hide-and-seek. Round the limb over my head they madly raced one after the other, the tail of one disappearing just as the head of the other came in sight.

They continued this game for some time, when they were joined by a third squirrel, and then the race round the arm of the tree was suspended and the three dispersed among the wide-spreading branches of the old tree, in which they appeared perfectly at home, a *dulce domum* and playground in one. Squirrels, as a rule, are shy, and will cleverly hide themselves behind the trunk or limb of a tree, rearing themselves upright and keeping the long bushy tail in a line with the body, so that it does not show. As a rule, if you want to see anything by wood or stream, keep still, and in nine cases out of ten the creatures you are seeking will come to you. On more than one occasion I have had hares cross over my feet when standing perfectly still. Whilst lying under the oak I caught a glimpse of what appeared to be a deer, but so noiseless was its approach, and so gliding and stealthy its motion, it was gone like a shadow, and disappeared in the thicket before I could realise its activity. As the afternoon was now considerably advanced, I thought it time to regain the high road from which I had diverged, but I could

not find it. Then I thought I would retrace my steps to where I had rested under the old oak, but the old oak tree had disappeared: there were trees and trees in abundance, but not my tree. If not exactly lost, I was for some time puzzled to find the way out, and the thought of getting further into the maze was not reassuring. A night in the forest, however romantic it might appear to an outsider, would probably be anything but a pleasant experience for the belated stranger unused to the landmarks and there for the first time. At last I encountered a man on horseback, who advised me to strike out into the open in a certain direction. I followed this advice and found myself in totally different surroundings from the way I had come. And to this hour it is a mystery to me as to where I struck in, and a greater wonder still as to where and how I got out. However, I found myself at last in Brockenhurst in time to catch a train to Southampton, and so ended my day in the New Forest.

WHY NOT MAKE THE NEW FOREST A PERMANENT AND NATIONAL PRESERVE FOR BIRD-LIFE?

THE increased and increasing interest in our British bird-life makes me ask whether any pressure can be brought to bear upon the Hampshire County Council to introduce again this year their proposal to schedule the bird-life of the New Forest for stricter preservation. A writer in the *Field* of a few weeks ago gave it as his opinion that the depredation of birds' nests allowed to go on during the nesting season had so thinned the bird-life in the New Forest as to rob the great national woodland of one of its chief charms. The writer stated that the County Council was willing to mend matters, but their suggestion to preserve the bird-life of the Forest by the application of the Wild Birds Act *in extenso* had been nullified by the local Crown authorities. It seems a great pity that some understanding cannot be arrived at between the County Council and the Crown.

The Crown woodland is only a small portion of the Forest, and one would expect that the slight interference with shooting and sporting rights would have been compensated for by increased rest for the larger game, the deer that belong to them. At any rate, one would urge that the verderers of the New Forest, who are not always in agreement with the Crown official view as to management of the New Forest, should be sounded on the matter, and the question of making the most ancient of our national forests a permanent preserve for wild bird-life should be brought before the Hampshire County Council. Of course, one can only appeal to local branches of the Selborne Society, or bird lovers in the neighbourhood of the Forest to set the ball rolling.

H. D. RAWNSLEY.

THE TRIPPER AND THE RESIDENT.

(Vide the recent correspondence in the "Field" and the "Spectator.")

The sun was shining brilliantly,
Shining with all his might;
He did his very best to make
The Forest gay and bright.
And birds and beasts on ev'ry hand
Rejoiced in warmth and light.

The trees were green as green could be,
The heath was dry as dry,
The rabbits, deer, and other beasts
Lay low when folk went by.
But this was natural, because
Wild things are always shy.

The Tripper and the Resident
Were walking close at hand,
They grieved like anything to see
So desolate a land.
"If it were only full of life"—
They said—"it would be grand."

"If seven miles could be enclosed
And stocked with various deer,
Do you suppose"—the Tripper said—
"That you could keep them here?"
"I doubt it," said the Resident,
"The gipsies are too near."

The Tripper and the Resident
Walked on a mile or so,
And then they rested on a bank
Conveniently low;
While all the dogs they'd brought with them
Went hunting too and fro.

"We've come some way," the Tripper cried,
"And talked of many things,
But I've not seen a hawk, or jay,
Or little bird that sings,
No squirrel, woodpecker, nor game,
Nor anything with wings."

"Now listen," said the Resident,
"I have a famous plan.
We'll do away with Verderers
And all that foolish clan;
Then let the nation appoint
Some really able man."

"A sanctuary," the Tripper said,
"Is what you chiefly need;
Hunting and shooting must be stopt:
They're very wrong indeed.
Then beavers, antelopes and deer
Could be turned down to breed."

"My friend"—then said the Resident—
"We've had a pleasant run:
We'd best be getting home again,
Though creatures we've seen none."
('Twas odd they never guessed how they
Had frighten'd every one.)

E. F. C.
W. M. C.

FOREST ADMINISTRATION.

THE primæval forests which covered a large portion of England were at various periods much reduced by the demands of an increasing population for agricultural land and for building sites. The very word *field* has been connected etymologically with felling. Such clearing was apparently active during both Roman and Early English times. The uncleared residue at the time of the Norman Conquest was apparently the land then practically valueless for agricultural purposes, owing to its being too light, too heavy, insufficiently drained, or too rocky; and this is in the main the character of English forest land to-day. From the earliest settlement of the country, the forest land, unenclosed, and either ownerless, common property, or at least, subject to various customary easements, was of the greatest utility to those who occupied the clearings or the purlieus. Wood, charcoal, peat and turf were the only fuel, wood the chief building material: wooden utensils were used in nine cases out of ten in which metal or earthenware is now employed: the pannage of mast and acorn fed that valuable asset, the swine; and the herbage of forest glades or open heath furnished pasture for horse, ass, and horned cattle. The commoners' rights which then arose constitute one of the great difficulties of forest administration at the present day, especially in the larger forest areas where villages exist entirely surrounded by woodland. Rights to top and lop, such as existed until commuted, in the Epping remnant of the great forest of Essex, were fatal to the growth of healthy timber, and to much of the beauty of our woodlands. Turbary rights, as now exercised in the New Forest, in comparatively dry spots, where there is no true formation of peat, small as is their value in real yield of fuel, have probably done much to so impoverish the land, by removing every vestige of organic accumulation, as to make it now well nigh incapable of supporting tree life.

No one, we imagine, who has seen Miss Kemp-Welch's spirited picture of Forest Ponies, now in the Tate Gallery, will wish to deprive the New Forest of such an element of the picturesque as these ponies afford; and there is very probably considerable truth in Mr. Auberon Herbert's contention that we owe the "lawns" of the Forest very largely to the action of the commoners' cattle. At the same time, though some seedling trees do grow up in the midst of protecting thorns, it cannot be denied that cows are decidedly detrimental to young trees; so that the question arises whether it is not essential, in the interests of the nation, that parts of the Forest should be from time to time enclosed, to permit regeneration.

In Norman times, another reason for forest conservation became prominent. They were looked upon mainly as hunting grounds for the king and the nobility. Common rights were not objected to, so long as they did not conflict with game preservation. Poaching became the chief forest offence; and, so far from enclosure for cultivation being permitted, there was a constant endeavour to enlarge the bounds of the forest. It is from this period that we inherit our modern game laws; and, though the keeper is often too fond of using his gun for the destruction of useful or harmless "vermin," he may, when properly instructed, be utilised as a protector—and some protector is indispensable—of wild life in a forest sanctuary. "Vested interests" are costly things to get rid of; and, since as long as hunting and shooting rights remain the sportsman will pay the keepers for game preservation, whilst in that "Adamless Eden," a pure sanctuary, keepers must be provided from other sources, we can well understand the attitude of Mr. Whitburn and the Guildford Society as to Wolmer Forest, described in our last month's issue. It is true that, though hunting and shooting rights were not altogether extinguished in Epping Forest when that area was rescued alike from the builder and from the lopper, we have there the forest-keeper without a gun, and preservation of wild life other than game; but the case of this comparatively small area is altogether dissimilar to those of the New Forest and the Forest of Dean. Though affording a convenient pleasure resort to the largest urban population in the world, Epping Forest does not so entirely enclose any village that no land other than forest is to be had for "accommodation land," public purposes, or building expansion. It has, moreover, the large trust funds of the Corporation of London upon which to draw for its keepers' wages.

Though the welfare of the deer may have led to the encouragement or even to the sowing of beech, as it did to the protection of the crab-apple from lopping, there does not seem to have been any systematic artificial regeneration of forest in Norman times. The forester of those days of romance when Mr. Maurice Hewlett's Forest lovers led their adventurous lives in Morgraunt, was interested in the venison, but not, like his

modern namesake, in the trees. It was not probably till late Tudor, or early Stuart times that our woodlands were considered as important as sources of timber for our navy; but, though the advocacy of Evelyn perhaps did more for park arboriculture than for forest regeneration, this new aspect of forest administration did much during nearly three centuries—say from 1550 to 1850—to determine the management of Crown forests. We see the effects of this in the fine old woods both of the New Forest and of the Forest of Dean; but during the same period woodlands which were not Crown property, such as the original Ashdown Forest, were practically cleared to furnish fuel for our ironworks when smelting with pit coal was unknown.

(*To be continued.*)

OBSERVATIONS FOR YOUNG BOTANISTS.

IV.—Leaves and Stipules.

IMPLE and Compound Leaves.—Leaves are either simple, consisting of one blade only, or compound, *i.e.*, having two or more distinct leaflets. Many leaves have appendages at the base, called stipules, either free from the leaf-stalk as in the pea, or adherent to it as on the leaf of the rose.

Compound leaves are derived from simple ones. Search over some blackberry bushes: simple leaves will be found near the flowers, then a three-lobed leaf may be seen, then a compound leaf of three distinct leaflets—this last may have the two lower leaflets lobed—then finally a leaf with five distinct leaflets will be found. A similar search should be made on plants of cinque-foil (*Potentilla reptans*), and leaves from one to seven leaflets may be discovered.

Form.—The commonest form is a broad blade standing horizontally to get as much light as possible from the sky; but when plants grow thickly, so that the leaves must be erect, they then acquire a narrow, grass-like form. It may be noticed how pinks, thrift, sedges and grasses have this kind, as the result of growing in a tufted manner. If the student have a microscope he would find that the breathing pores or stomates in these erect leaves are on both sides, and not only or mainly on the upper surface.

Aquatic Leaves.—Submerged leaves take one of two forms: being either finely dissected, as those of the white-flowered water crowfoot (*Ranunculus heterophyllus*, &c.), water-violet (*Hottonia palustris*), *Myriophyllum*, &c.; or else, a ribbon-like shape, as in mares'-tail (*Hippuris vulgaris*), and the arrow-head (*Sagittaria sagittifolia*). These forms are entirely due to the leaves being under water, as in this condition they grow

vertically and are prevented from being as fully formed as in air. Thus, when the leaves of the arrow-head reach the surface, they produce blades, at first oval, then like an arrow-head, rising out of the water.

Fleshy Type.—Plants which grow in very dry and hot localities are obliged to store up water for several months, when little or no rain falls. Such plants are well seen in desert regions—as the cactuses of Mexico, the euphorbias of the Soudan, &c.—but we have several natives which do thus, as the sedums and house-leeks. These leaves have very thick skins, and so lose very little water by transpiration.

Juniper-like Type.—Most gardens contain shrubs of the juniper, cypress, or thuja kind, remarkable for their extremely minute leaves closely pressed against the twigs. This is a result of growing in dry mountainous regions; for there are some kinds of *Veronica* (our English blue-flowered speedwell is of the same genus) which are evergreen shrubs in New Zealand; and those which grow high up on the mountains have precisely similar foliage.

These few examples will show the young student how he should observe that the numerous forms and characteristics of leaves depend entirely upon the external conditions in which they and their ancestry have grown. Thus trees, as oaks, which shed their leaves in England, retain them a much longer time in South Europe, and may become evergreens where there is no severe winter climate like ours.

He may also notice how monocotyledons have mostly long leaves with parallel veins, as is easily seen in a blade of grass. Now we have seen how a ribbon-like leaf is one type of submerged leaves. This fact, coupled with a large number of others, has rendered it extremely probable that all monocotyledons have descended from aquatic dicotyledons. Several, of course, are now terrestrial, but they still retain many features of an "aquatic" character; *e.g.*, notice that the skin of a banana shows a network of *square meshes* inside it. A similar network is seen in *oval* aquatic leaves of monocotyledons.

Metamorphosis of Leaves.—Leaves are often used for other purposes than their natural one, viz., that of assimilating carbonic-acid gas from the air; thus tendrils are often made out of them, as in the pea family, such as peas and vetches. In these tendrils the little sensitive branchlets can be seen to correspond with the "mid-ribs" of the leaflets.

In *Clematis*, however, or the traveller's joy of our hedges, the leaflets are retained, and it climbs by means of the leaf-stalks or petioles. Experiments should be made in placing a stick so as to touch a tendril and examining it after a few hours, when it will be found coiling round it.

Stipules.—These really represent a pair of leaflets; but when they are unattached to the leaf-stalk, from which they really arise, the union is lost to sight within the stem itself, so

their true points of connection are concealed below the surface of stem, out of which they appear to rise.

Stipules takes various forms; sometimes they are foliaceous, or leaf-like, as in the garden-pea. This results as a sort of compensatory process to make up for the loss of the blade, the majority of the leaflets having been converted into tendrils for climbing. The galiums, as ladies' bedstraw, cleavers, &c., seem to carry whorls of leaves, but only two (one of which generally has a bud or branch arising from its axil) are true leaves. This can be readily proved if a thin section be made just above and below the position of the whorl. If it be held up to the light, besides the circle of woody fibres, which throw off a cord to each of the pair of opposite leaves, an outer zone connecting these will be observed, *from which* arise the cords entering the stipules.

In many trees, as the lime,* elm, oak, beech, &c., the bud-scales are stipules, while the leaves belonging to them are not developed at all. The student should compare them with the bud-scales of the horse-chestnut, ash, maple and currant, which he will find to consist of flattened leaf-stalks, as rudiments of the blade will be seen on the top, there being no stipules to these latter trees.

G. Henslow.

REVIEWS AND EXCHANGES.

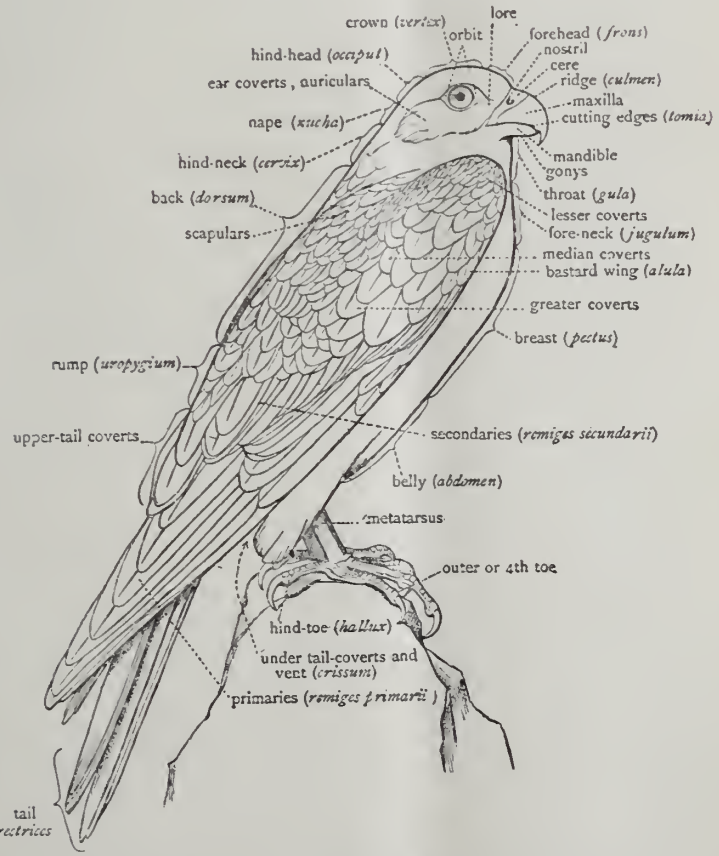
The Cambridge Natural History: Volume ix. *Birds.* By A. H. Evans, M.A. Macmillan & Co., 8vo. Price 17s. net.

We venture to predict that, of the ten volumes of which this excellent series is planned to consist, none will secure a wider popularity than Mr. Evans's treatise on birds. Strange as it may appear, among the many books on birds that have appeared of late years, we do not recall any that covers the same ground. The author has, as he says in his preface, "essayed the difficult and apparently unattempted task of including in some six hundred pages a short description of the majority of the forms in many of the families, and of the most typical or important of the innumerable species included in the large Passerine Order," prefixing to each group a brief summary of their structure and habits. An introductory chapter—all too brief—deals with general external and skeletal characters, classification, distribution and migration; but a vast range of most interesting topics, such as variation and flight, are omitted, as beyond the scope of the work.

Space does not permit us at present to quote as an example of the practical character of the book the whole of the description of a feather, but the following is an admirably concise treatment of part of this subject:—"The colour of feathers is due to one of three causes, first, an actual pigment may be present in certain corpuscles, or in diffused solution, and the tint does not then vary according to the incidence of the light; secondly, it may arise from a pigment overlaid by colourless structures in the form of ridges or imbedded polygonal bodies; here

* The reader is referred here to an article "Notes on Buds" in Nature Notes (Jan., 1897, p. 6) for further details.

NIGHTJAR OR GOATSUCKER (*Caprimulgus europæus*).



A FALCON, SHOWING THE NOMENCLATURE OF THE EXTERNAL PARTS.

if the vanes are scraped or held up to the light, the pigmentary colour alone is visible; thirdly, the colour may be iridescent or prismatic; that is, a blackish pigment may lie beneath the surface, which whether polished, ridged, or pitted, acts as a series of prisms, causing the hue to vary according to the relative position of the spectator's eye and the light."

A subject which is being at present discussed in our pages is thus dismissed:— "The careful observations of Jenner, Hancock, and Mrs. Blackburn show that the young cuckoo, when some thirty hours old, begins unaided to remove from the nest the rightful progeny or unhatched eggs by means of its broad back, which has a central depression for the first twelve days; but after this hollow is filled up the desire is said to cease. It pushes below a nestling with its wings, and raises it with much exertion to the edge of the nest, finally ejecting it by a supreme effort."

The two specimens of the illustrations which, by the courtesy of Messrs. Macmillan, we are able to reproduce, exemplify, the one the practical character of the whole work, the other the wonderful detail of the draughtsmanship of Mr. G. E. Lodge, from whose pencil are most of the 114 woodcuts.

It would, of course, be easy to emphasise omissions in a work of this size; but we are grateful to the author for the mine of valuable information which he has crowded between his two covers.

Twenty-six Common Birds. By Ralph Hoffmann, to accompany Audubon Bird Chart. Massachusetts Audubon Society, Boston. Price of chart, one dollar, unmounted; one dollar thirty cents, cloth mounted, on rollers.

A concise account of the commonest birds of New England.

The Naturalist's Directory, 1899. By L. Upcott Gill. Price 1s.

This is the fifth annual issue of this invaluable desk companion, which has become indispensable to every naturalist.

Nesting Boxes for Birds. By Joseph King. The Peasant Arts Society, 8, Queen's Road, Bayswater. Price 6d.

This excellent little pamphlet, by an old member of the Selborne Society, is illustrated by three woodcuts of nesting-boxes. These boxes are sold by the Peasant Arts Society at 1s. 6d. each. The woodcuts, the artist of which is not named, make us realise that there is still hope for wood-engraving in England.

One and All Gardening, 1899. Edited by E. O. Greening. The Agricultural and Horticultural Association. Price 2d.

Except as an advertisement, we do not understand how the interesting popular annual of which this is the fourth issue, with its 200 pages crammed with portraits, beautiful garden scenes and other illustrations, varied "appreciations" of gardening and practical advice, can be produced at the price. From the same office we have received copies of the *Agricultural Economist*, *Illustrated Monthly Review of Agriculture*, *Horticulture and Co-operation*. Price 6d.

The Animals' Friend for February and March is, as usual, remarkable for the excellence of its illustrations.

Science Gossip has inaugurated the excellent practice of appearing on the 25th of the month. In its March number Mr. Herbert Goss urges the preservation of Wicken Fen as a sanctuary, whilst in that for April, Mr. E. A. Martin has an illustrated article on the preservation of Crohamhurst.

In the March number of *Knowledge*, Sir Edward and Miss Agnes Fry continue their interesting story of the Mycetozoa, and Mr. Lydekker has an article suggesting Siberian Mammoth ivory as a substitute for that of the African elephant, which becomes scarcer year by year.

Received:—*Board of Agriculture*, *Leaflet*, No. 28, *Anthrax; Humanity; Animal World; Our Animal Friends; The Naturalist; The Irish Naturalist*, for

February and March; *Journal of Applied Microscopy*, November, 1898; *Seventh Annual Report of the Women's Branch of the Horticultural College, Swanley; Annual Report of the Bristol Libraries Committee*, and *Science Work*, No. 2, March.

NATURAL HISTORY NOTES AND QUERIES.

Cannibalism of Dormice.—I am writing as I thought some of your readers might be able to explain the following:—About a fortnight ago I had a pair of dormice in a large roomy cage with sleeping apartment and nest of felt. When feeding them as usual one night I noticed that very little of the food was touched, so taking down the cage I took out the female mouse and felt inside for the male, but could not find him; so I took out the felt nest (which I had had made of a round chocolate-box filled with felt) and in the loose felt at the back I found the male mouse dead with a hole bitten in his side and his inside eaten out. No wild mouse could have possibly got into the cage, as it is wired with very fine square mesh wire. This looks like murder and cannibalism on the part of the female mouse. Can any of your readers give a similar experience?

Warwick House, Cheltenham. CHAS. A. A. DIGHTON.

The Toad.—My experience of toads is that they bury themselves in winter, and in the case of one which I watched for three years, in a very dry place. He took up his abode in my fernery, and one spring morning I saw a portion of the surface, which was particularly fine, dry and smooth, heaving as if some living thing were beneath, which proved to be a large toad waking from his winter's sleep. One day we saw him sitting very still with his head on one side in a listening attitude close to an old root, and in about an hour's time the air was full of winged ants which had come out of the ground at his feet, and which he was catching with his long tongue, at the same time closing his eyes and making terrible grimaces, painfully suggestive of choking. The next winter he buried himself again, not far from his first nest, and in spite of careful watching I did not see how he did it. The next year I caught him in the act and watched him with great interest from behind some creepers. He had chosen a different place and had got his hind legs into a slight hollow in the ground, and was shovelling the fine earth with his hind feet, in showers over his back, forwards. Unfortunately, in my eagerness to see better, I suppose I made a slight noise, for he suddenly ceased and marched indignantly off across the path to a more secluded ivy-covered corner, and to my great disappointment did not return. The way in which he shot the earth over himself quite explained the fine even surface which was presented when he was completely buried, and which never suggested the possibility of such a large animal being secreted underneath. My great desire is to see a toad cast his coat, roll it up and swallow it, as it is said they do. Is this a fact?

M. S. Y.

Cock Pheasant Rearing Young.—A friend whom I often consult on matters relating to Natural History, and in whom I have every confidence, sends me the following account of a cock pheasant's doings, which occurred at Euston, the seat of the Duke of Grafton, a few miles from here. My friend has supplied me with the names of the persons who saw the bird, which I have omitted here. "Five or six years ago J. B., who was watcher on the Home beat, found in a covert there, called Gravel Pit Hill, on the Barnham Road, a cock pheasant sitting on eggs. He saw him repeatedly, and never saw a hen near the nest. One day he saw him off the nest about twenty yards away feeding, and the bird clapped his wings, and crowed like any other cock. Having finished he went back to the nest. A stoat, or some other beast, took some of the eggs till there were only four. The keeper of the beat, by name S——, filled up the nest with other eggs, until there were either nine or eleven. These the bird hatched, and was seen feeding with them until they were as big as partridges. B. is sure that

the bird was a cock, having the male head and tail. He showed the bird on the nest to the agent, the former agent, the head keeper, his own son, and others; and they none of them could make it out. B. is quite a reliable man, and has been accustomed to pheasants all his life. He cannot account for it in any way, nor can I."

It may be suggested, as a solution of this unusual occurrence, that the bird was not a cock after all, but merely an old hen which had assumed male plumage and had taken to crowing. But these ancient females are barren, and are death on eggs and young birds, which they seem to delight in destroying.

EDMUND THOMAS DAUBENY.

"A Cuckoo Myth."—On page 18 you print the letters of two esteemed correspondents, replying to some previous remarks of mine in which I ventured to deny the accuracy of the story told by Dr. Jenner as to the "peculiar habit of the young cuckoo in ejecting his foster-brothers"—and sisters, I suppose I should say, if I wish to avoid calling down the wrath of your scientific readers and of Mr. James Hiam. Why should the direct evidence of Mr. James Partridge be ignored? asks Mr. J. L. Otter, of Brighton. Why, indeed! If his story is similar to the one which Jenner accepted the parentage of, as repeated by Mr. Hiam and others, then the reason why it should not be believed is because it is not true. Mr. Otter innocently quotes an extract from "The Origin of Species." I have seen that quotation elsewhere. I have not taken part in this particular dispute so frequently as I have done during the last ten years without picking up a few facts and seeing many a bold lie mercilessly laid bare; but lies are wriggling things, so that it is not a little difficult to fix them firmly to the proverbial counter. And the bigger the lie is the worse the job, even supposing you have caught up to it. "A little observation is better than a great deal of theory," remarks Mr. Otter. But who said "theory"? And as to Darwin, certainly, in this instance, he is the theoriser. If he had observed more and taken less on credit from others he would not have made quite as many mistakes as he did. Darwin did not go direct to Nature for *all* his facts. Darwin accepts the story of the newly-hatched cuckoo, together with the Atlas-like conformation of his back, on the authority of Mr. Gould, the bird-painter. "Mr. Gould," says the great biologist, "was formerly inclined to believe that the act of ejection was performed by the foster-parents themselves. But he has now received a trustworthy account of a young cuckoo which was actually seen, while still blind and not able even to hold up its head, in the act of ejecting its foster-brothers." Mr. Gould adopted this "trustworthy account" from a lady artist, introduced it in his "Birds of Great Britain," and, by the aid of a few fancy touches of his own, gave it pictorial representation; the result being that the lady, whose artistic powers were already sufficiently vivid, repudiated all responsibility for the details.

JOSEPH COLLINSON.

I observe in the December number of NATURE NOTES, an article headed, "A Cuckoo Myth," and would like to refer the writer to "Ceylon Birds," by Colonel Legge (now Commandant of Volunteers in Tasmania), page 225, where he will find a corroboration of Dr. Jenner's facts by an eye-witness, Mrs. Hugh Blackburn, who published what she saw in *Nature*, No. 124. This is copied in "Ceylon Birds" with a facsimile of her sketch. "When doctors differ," &c.

Coomooboolaroo, (MRS.) GEO. BARNARD.
January 24, 1899.

Bud-destroying Birds.—I was glad to see in NATURE NOTES for March, the remarks on the mischief done by bullfinches. In one's zeal to preserve the life of birds it is a mistake to overlook the delinquencies of some of them. Bullfinches spend most of their lives, at all events during the spring, in devouring the sound buds of trees and shrubs. No doubt other finches are not quite immaculate, but even the sparrow, which does considerable damage to the buds on our fruit trees, has his good points, for he is a great devourer of cockchafers and such like beetles, that are so injurious to the farmers' crops. Tom-tits are often put on the black list of bud-destroyers. I have watched their supposed wrongdoings in this matter, and acquit them of actual harm. Tits are great insect-eaters, though they

are not averse to picking a bone, or killing a newly-hatched bird. They do not destroy sound buds, but those which have been hollowed out by some insect, and consequently cannot come to maturity. Two years ago I noticed a perfect halo of buds on the ground round one of my pear trees, and frequently caught the tits at work on it. I examined the ends of the twigs from which the buds had been picked, and the fallen buds as well; and to make doubly sure I used a magnifying glass. In no case could I discover that a sound bud had been touched, but only those that were tenanted by a small grub. The tree was so infested by this insect that very few buds came into bloom, indeed, hardly any were left. Last spring I again examined the same tree. It was the reverse of the year before; the buds were free from grubs and there was a splendid bloom. For this I had in no small measure to thank the sharp eyes of the tits, as they had effectually killed down the real enemy. In short, tits destroy damaged buds only to get at the author of the mischief. EDMUND THOS. DAUBENY.

Market Weston, Thetford.

Swallows and their Nests.—A friend sends me the following true story:—

"Last year some swallows commenced building just against my bedroom window. Not wishing them to make their nest just at that spot, I put my boy's toy sheep up there, with his big black eyes looking towards them. Now, thought I, you will move a little farther along. A few days later I looked up at the window, and there! *on* the woolly lamb hung two swallows helping themselves freely to the wool for nest-lining purposes!! I took the scarecrow down."

Foxton, Cambs. A. M. GREENWOOD.

Abnormal Birds' Nests.—At a recent meeting of the British Ornithologists' Club, there was an interesting exhibition of nests, all showing considerable departure from the normal form. Mr. E. Bidwell, with whom the idea originated, sent the largest collection. This included a heron's nest, built almost entirely of wire, such as is used in some reaping machines to bind sheaves, which appeared to have been gathered by the birds when the corn was threshed. The nest was blown out of a tree at Stoke Park, Notts., and then, with the aid of a field-glass, it was seen that there were, in the heronry, other nests of the same character A turtle-dove's nest made of wire would have been shown, but for the owner's absence from England. Some Indian crows have discovered what good nesting material wire makes, and nests formed of wire from soda-water bottles have been described in scientific journals. There were also chiff-chaffs' nests without the usual feather lining, a nightingale's nest and a sedge-warbler's nest lined with feathers instead of fibrous roots in the one case, and hair in the other; a wood-chat's nest built entirely of flowers, a swift's nest into which feathers had been worked, and a moorhen's nest in which the bird, when disturbed, had covered her eggs with pieces of newspaper and the wrappings of champagne bottles—evidently left by a picnic party. Mr. P. Crowley exhibited the nest of a chaffinch into which a good deal of paper had been worked, and Mr. Howard Saunders showed one covered with confetti. Mr. Gerrard sent a wren's nest, wanting the usual dome-like covering, taken from a hole in a bank in Shetland. Mr. A. H. Macpherson showed the nest of a spotted flycatcher, built to a great extent of wax vestas, with pieces of thread and silk. It had also the paper of two cigarette-ends embedded in the sides. To illustrate the not very common practice of birds building inside the nests of other birds, Mr. R. H. Read exhibited, among others, the nest of a wagtail built inside the old nest of a blackbird, and a robin's nest built inside the old nest of a thrush. In this last case there was a cuckoo's egg inside the robin's nest, so that the original structure served three different species.

White Wild Duck.—Five years ago, Mr. Charles Ambrose, of Ely, discovered two white ducklings in a brood of pure wild birds. These were caught and isolated, the result being that out of a very large team or flock of wild duck, every bird is now hatched pure white.

Nothing can exceed the elegance of these birds, either in their movements on the water or their flight, which, by the way, seems rather more quick than that of their darker-coloured progenitors.

Hawk in the City.—On February 16, about noon, a hawk, which had been hovering about Guildhall Yard, suddenly pounced down amongst the pigeons in Guildhall Yard, and bore off in its claws a fine young pigeon. The incident, which is unprecedented, was witnessed by many people. A correspondent suggests that what was taken at the time to be a hawk was probably a young peregrine, and adds :—"This fine species has frequently been noticed in London, sometimes near St. Paul's—a good spot for a passing bird to rest—and some years since one frequented the dragon vane at the south-west corner of the Natural History Museum for many days."

[An illustration of this incident appears in the "West End" for March 11th.]

Missel-thrush, Alder, Hippophaë. — In Mr. Dixon's useful and interesting book, "Annals of Bird Life," the missel-thrush is said to sing throughout September, October, November, December, January (twenty-five days), and February (twenty-four days). I have made special observations for the last two winters as to this statement, with the result that I heard the missel-thrush for the first time on January 23, 1898, and on January 22 this year, and in both years the full song was not heard, or heard daily, till February, and this, though the birds have been seen daily in and about my garden since the end of summer. A Hertfordshire friend confirms my own observation. Can it be that the habits of the bird are different in other parts of the country? It does not seem likely that so keen an observer as Mr. Dixon should be mistaken. May I add another note. Of two alder trees blooming side by side I found the male catkins of one and the female catkins of the other ripe, the corresponding flowers in each unripe, thus ensuring cross fertilisation. I am successfully growing the sea buckthorn, but it flourishes best in a soil more or less impregnated with salt, as in Worcestershire, where I have seen it growing more than twelve feet high, and covered with the very beautiful orange berries.

White Notley Vicarage, Witham, Essex. A. F. CURTIS.
February 17, 1899.

Wasp in February.—On February 19 I captured a female wasp (*Vespa vulgaris*) flying on the inside of my "sanctum" window. R. M. W.
Stoke Newington.

American Buckthorn.*—Having read lately various articles on this plant, I think the following may interest your readers. It is by the above name I have known it for the last twenty years and more, growing well at Westonbirt, on the high table land of the Cotswold, about 500 feet above sea level, far inland. It was planted there by the late R. S. Holford, Esq., and is a beautiful unit amongst the many rare and beautiful trees and plants which he introduced to the country. In summer the grey-blue leaves of the buckthorn form a pretty undergrowth, or rather foreground, in many a copse and glade in the great "Silk Wood." Planted in front of noble groups of cedars, pines, yews, &c., it spreads by suckers and seedlings, and in one place it disputes the territory of a wide open glade with the young silver birches which are springing up with it in great numbers. In late autumn, when the leaves are gone, the orange berries on the blue-grey thorny spikes are very fine. Perfect masses of them occur, and one gets the full benefit of them as the birds do not attack them until they have eaten many other sorts of berries. The smell of the berry is exactly like that of rotten apples. In Silk Wood the soil is sandy and the buckthorn thrives there, but it grows well on a bank in Westonbirt gardens a mile or two away, where the soil is not sandy. A very fine effect is produced in various plantations and woods at Westonbirt by planting patches of dog-wood in foregrounds such as described above. When kept cut every year, this in winter is brilliant crimson. I mean the *one* year's shoot is crimson only, so that unless it is cut annually it is merely a straggling green growth with red tips. Treated as a crop and cut,

* The name is an unfortunate one, since *Hippophaë* is not a native of America.—ED. *N.N.*

you get a crimson patch of colour when the leaves are off. Have this where the bracken's bronze glory lends another patch of colour, and bracken, buckthorn and dog-wood combine to make a winter glory "bad to beat." In planting buckthorn people should be careful to plant both male and female plants, or there will be no berries. MARGARET RICH.

Warwick Square, S.W.

SELBORNE SOCIETY NOTICES.

Annual Meeting and Conversazione.—The date of the Annual Meeting and Conversazione has been fixed for Wednesday, May 31. The Secretary will be glad to receive offers of exhibits, pictures, lantern slides, &c., as soon as possible.

Donations towards Reduction of the Deficit.—The Council acknowledges with thanks the receipt of the following donations:—Mrs. Hyde Clarke, £1; Mr. and Mrs. G. A. Musgrave, £2 2s.

The following have increased their subscriptions:—H. Hastings Crewe, Esq., to 12s. 6d.; Mr. and Mrs. G. A. Musgrave to 10s. 6d.; W. T. Stillman, Esq., Mrs. Harman, and H. E. Luxmoore, Esq., to 10s.; Mrs. Needham to 7s. 6d.

Council and Committee Meetings.—The next meetings of the Council will be held on Tuesdays, April 4 and May 2, at 5.30. The Magazine and Leaflets Committee will meet on Tuesdays, April 18, and May 16, at 5.30.

BRANCH PAYMENTS FOR 1898.

Payments for Magazines.			*Contributions.*	
Abinger and Shere	2 7 8		(Donation)	1 0 0
				0 14 2
"Atalanta"	(sub.) 2 15 3			...
Barmouth	... 2 5 6			...
Bath	... 2 18 4		(Donation)	5 0 0
Birmingham	... 12 15 8			4 6 8
Brighton	(sub.) 2 9 10			...
Farnham	... 1 14 8			2 18 0
Halifax	... 3 5 0			0 8 0
"Markwick"	(sub.) 1 7 6			...
N. Somerset	... 2 12 0			0 8 0
Northern Heights ...	... 10 8 0		(Don. and tithe)	2 14 0
Nottingham	(sub.) 3 0 0			...
Petersfield	(sub.) 0 17 6			...
Rape of Lewes... ...	... 3 9 4			0 14 8
"Richard Jefferies" ...	... 3 0 0			0 8 6
Selborne and Liphook	(sub.) 2 11 0			...
Southsea	(sub.) 1 2 6			...
Weald of Kent— ...	(sub.) 1 7 6			...
Wimbledon and Putney	... 4 10 0		(Donation)	5 0 0
	£64 17 3			£23 12 0

Field Club Saturday Rambles:—

Saturday, April 15.—Sanderstead and Crohamhurst. Book to South Croydon. London Bridge (L.B. & S.C.R.), 2.55; Victoria, 2.45; Thornton Heath, 3. Note that West Croydon Station is not on the line of route. Tea at Old Fox

Farm at 5.30. Guide, Mr. E. A. Martin, F.G.S., Hon. Sec., Crohamhurst Preservation Committee.

Saturday, April 29.—Meet at Ongar Station on arrival of train leaving Liverpool Street at 2.8, and hence to Greensted to view Saxon Church, &c. Return fare, 3s. 1d. Guide, Mr. S. Austin.

NEWS FROM THE BRANCHES.

Clapton.—The Annual Meeting was held at the North East London Institute on March 18, when the Report was read and adopted. Mr. J. D. Hardy, F.G.S., was elected a Vice-President to fill the vacancy caused by the removal of Dr. Gerard Smith from the district; and Mr. C. Nicholson, F.G.S., was elected as delegate to the Council. All other officers were re-elected.

The meeting was followed by the last of the winter lectures, which was given by Mr. S. Austin on Gothic Architecture, Mr. Jas. Wheeler kindly giving excellent lantern illustrations to the same.

ANSWERS TO CORRESPONDENTS.

Miss Angus.—The young leaf sent is not that of *Archangelica officinalis*, nor do I recognise it as a British plant. Is it the giant cow-parsnip of Siberia (*Heracleum giganteum*)? Please send specimen of flower, leaf and fruit later.

Col. Harris.—Nothing seems to have been done as yet in breeding pearl oysters. The work most germane to the matter is a "Report on Pearl Fisheries and Chank Fisheries," by Hon. Henry Sullivan Thomas, F.Z.S., *Madras Government Press*, 1884.

Miss M. C. Schultz. — The mosses have been determined by Mr. A. Gepp, F.L.S., to be *Fissidens taxifolius*, *Barbula muralis*, *Funaria hygrometrica*, *Bryum atropurpureum*, *Brachythecium rutabulum* and *Eurhynchium prælongum*.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 113. MAY, 1899. Vol. X.

SELBORNIANA.

Annual Meeting and Conversazione.—The conversazione will take place, as previously announced, on Wednesday, May 31, from 8 to 10.30, at the Society's rooms, 20, Hanover Square, W. The Right Hon. Sir John Lubbock will give the Presidential Address, and will be supported by the Earl of Stamford, Professor Boulger, the Right Hon. James Bryce, M.P., Rev. Professor Henslow, F.R.S., Professor Hulme, Mr. John L. Otter and others. After the meeting a splendid selection of lantern slides will be shown, under the supervision of Mr. H. W. Ravenshaw, with descriptive talks by Mr. R. Kearton—whose book "Wild Nature with a Camera" is so well known to members of the Selborne Society—Mr. Graham Renshaw, Professor Boulger, and other members. There will also be an exhibition of birds' nests, paintings, microscopic objects, curios, &c. Branch Secretaries are requested to send in their applications for tickets of admission for members of the Society and their friends to the Secretary, 20, Hanover Square, W., if possible not later than May 20. Members requiring tickets should apply to the local hon. secretary, or, in the case of members unattached to branches, to the Secretary of the Selborne Society, 20, Hanover Square. A stamped addressed envelope should in each case accompany the application. It is particularly requested that those intending to be present will fill in their names on the ticket in the blank space provided for the purpose, and also that honorary secretaries of branches who attend will take steps to make themselves known to the Secretary or members of the Council.

Selbornian Matters in the Press.—It is certainly a matter for congratulation that almost the entire press seems to be strongly sympathetic towards true Selbornian principles. We make no invidious distinctions; but the *Standard* is certainly

one of the most prominent of the London dailies in this good cause. Besides the article on "The Vanishing African Fauna," which we are, by permission, about to reprint, it has recently published a timely leader against the extermination of our rarer ferns. This evoked a letter from Mr. F. G. Heath, who, wisely as we think, deprecates direct legislative protection and appeals to the Press to inculcate unselfish moderation in collecting. The *Daily News* for March 28 had a pathetic account of the pet rats, mice, flies and beetles tamed by George Bidwell, the forger, when in prison. The *Daily Mail* for April 6 very rightly heads an article on the recent payment by the Thames Angling Preservation Society, of two pounds for the killing of three otters, "The Doomed Otter." The *Daily Graphic* for April 15 gives an illustrated account of Ashdown Forest, the threatened light railway across which is now being opposed by the Commons Preservation Society and the National Trust. Nor is this satisfactory attitude confined to the daily papers. The *Westminster Review* for March contains an article on "Advertising Disfigurement," by Mr. Richardson Evans.

Drastic Legislation.—One advantage of the State Legislatures of America is that they often pass out of hand measures that Congress would probably take years to think over. For example, in America, as in this country, there has been an outcry against the wearing of birds and birds' wings in women's hats, but no one has thought of moving Congress on the subject. The Legislature of the State of Connecticut, however, has taken up the matter, and has under consideration a Bill providing for a fine of 7 dols., or 28s., to be levied on all women who wear birds in their headgear, and it further declares that the judges are empowered to cause such hats to be destroyed in their presence.

A Novel Reason for Slaughter.—Among the "reasons" given for the wholesale slaughter of our wild birds, perhaps the following is unique:—The keepers of extensive woods near here net or otherwise destroy, the flocks of starlings which roost in the trees on their migrations, "because they make the woods dirty!"—E. Hodges, *Clifton*.

Bibliography of Gilbert White.—Mr. E. A. Martin now has in his own hands the few remaining copies of this interesting work of his, and offers them to Members of the Society at the reduced price of half-a-crown a copy. Copies may be obtained through the Secretary as heretofore.

Kindred Societies.—The South-Eastern Union of Scientific Societies will hold its Fourth Annual Congress at Rochester on Thursday, Friday and Saturday, May, 25, 26, and 27, under the presidency of Mr. W. Whitaker, F.R.S. As the Selborne

Society is affiliated to the Union, any Members who can should attend this Congress.

The Eighth Annual Meeting of the Humanitarian League was held at St. Martin's Town Hall, on Tuesday afternoon (April 18), and was followed in the evening by a largely attended Conversazione of members and friends. The Report for 1898 shows a continued increase in the strength and activity of the League. A meeting is announced by the League for Wednesday, May 3, at 3 p.m., at the Westminster Palace Hotel, to advocate the legal repression of spurious sports.

The Third Annual Conference of the Parents' National Educational Union is announced for May 9 to May 12, at Portman Rooms.

Cruel Treatment of Frogs.—A lover of "all things both great and small," writes:—"These poor little creatures, at this time of the year, are often subjected to the most revolting cruelty at the hands of young men out for a holiday, or boys home from school. I live facing a large pond on one of the most beautiful of all our Surrey commons, and am frequently sickened by witnessing the sufferings of these innocent beings, who never do harm to anybody, but yet are most wantonly tortured. They are kicked about, trampled on, flicked about with sticks, or held up by one leg and given a sharp 'whack' with a cane, which sends them, mutilated and bleeding, to a considerable distance, whither they are again pursued, subjected to the same inhuman treatment, often several times, and at last brutally smashed and battered out of their wretched existence. I speak as an eye witness, and that not once, but a great many times, and any expostulation on my part would, I know only too well, meet with torrents of abusive ridicule. Such brutes are past reasoning with. I am most thankful to say that I have recently been successful in putting a stop to the bird-catching which has hitherto been carried on *ad lib.* on this magnificent common. Can nothing now be done for the poor frogs?"

FOREST ADMINISTRATION.

(*Concluded from page* 70.)

AT the Revolution of 1688 it is stated that more than half the area of the kingdom was forest, waste or fen; but such was the growth of our manufacturing population, and the consequent demand for corn and, therefore, for corn land, that by the end of the last century this area had been reduced by nearly 50 per cent., whilst we may be sure that the continuation of war prices continued to extend the "margin of cultivation" yet more, at least down to the date of Waterloo. Even at a later date, when English agricul-

ture felt not only the fall to normal rates, but the first depression from foreign competition after the introduction of free trade, one panacea was the cultivation of waste, and Hainault Forest was grubbed up in pursuance of this policy.

It is practically only within the last thirty years that the value of our open spaces as healthful pleasure-resorts for the nation at large has been recognised, and only during the latter half of this period that the desirability of the preservation of our wild flora and fauna, and the "balance of nature" in what are now known as "sanctuaries," has come to the front. Open spaces with trees and grass are excellent things; but if the cockney "sportsman," the trade "collector," the ignorant keeper and that survival of savagery, the all-destroying schoolboy, are to deprive them of all the charms of rare fern or floral beauty, of insect colour, or of bird's song, it is felt that they are deprived of a large portion of the influence for good that they might exert upon the spirit of those who visit them. Beyond any rights of Crown, commoners, or other residents, our forests and their wild life are the heritage of the nation.

Actuated by mistaken zeal for the preservation of the New Forest as a recreation-ground, an Act of Parliament was passed which will preserve the existing trees as long as they live, but by stopping all planting makes no provision for regeneration. If it be not modified the existence of the woodlands of the Forest is doomed. Of this the Crown officials are aware; so that when they come to Parliament with a Bill, it might be expected that it would deal with this matter. It is stated, however, that the Bill, drafted by the Commissioners of Woods, which is to be shortly introduced, is to enable them to enclose 250 acres in parcels of 25 acres, for gas, drainage and waterworks, or in sites not exceeding five acres for churches and schools, and to afford facilities for new roads to private houses. There is, apparently, to be some compensation to the commoners; but there does not appear to be any stipulation, such as was, we believe, included in the Epping Forest Act, that such enclosures shall be made only at a fair price, and that—in the interest of the general public—all proceeds shall be devoted to adding to the Forest area elsewhere, so that its entire area may be as little diminished as possible. There are, perhaps, more conflicting interests to be considered in the administration of the New Forest than in the case of any of our other woodland areas; but, as nature-lovers, we are all interested in the matter, and we can only express the hope that any proposed legislation will receive most careful consideration by the Amenities Committee of the two Houses. The Commons Preservation Society has already expressed itself as decidedly opposed to the Bill in its present form.

OBSERVATIONS FOR YOUNG BOTANISTS.

V.—Phyllotaxis or Leaf-Arrangements.

IF several leafy shoots from different plants be taken, it will be observed that many, probably the majority, have their leaves placed one at a time on the stem; or, as botanists say, *alternately; e.g.*, the garden flag, a sedge, the oak, and the holly. The rest will almost always have two leaves at the same position (or *node*), but situated on *opposite* sides of the stem: *e.g.*, lilac, privet, or horse-chestnut. Of the latter, it will be also noticed that *each pair of leaves stands at right angles to those above and below it.* Such series of pairs of opposite leaves constitute what has been called the *decussate* arrangement. Extended observations will only strengthen the conclusion that leaves are for the most part *alternate* or *opposite.**

Alternate Leaves.—If one take a branch of the may or oak, and hold it vertically, with any selected leaf before one, and then pass the finger upwards along the stem from that leaf to the next, and thence to the third, fourth, fifth, and sixth leaf in succession, it will be found that the one last reached (sixth) is exactly over, or in the same vertical line with, the first; and if we proceed further, we shall find the seventh is vertically over the second, the eighth over the third, and so on, the eleventh being, therefore, over both the sixth and first.

The following observations will result from this examination:—Obs. 1. All the leaves on the branch are arranged in *five* vertical rows; from this fact such an arrangement has been called *pentastichous.* Obs. 2. The imaginary line traced by the finger in passing from leaf to leaf successively is a *spiral line.* Obs. 3. This spiral line *coils twice* round the stem before arriving at the sixth leaf: the portion of the spiral intercepted between the first and sixth leaf is called a *cycle.* Obs. 4. A cycle *contains five leaves*, the sixth being the first leaf of the succeeding cycle.

The method adopted to represent this arrangement is by means of the fraction $\frac{2}{5}$. The numerator (2) indicates *the number of coils in a cycle.* The denominator (5) *shows the number of leaves in a cycle.*

Let a complete cycle be projected on a plane surface, and represented by a "helix" (a spiral line like a watch-spring) having two complete coils, and let the corresponding positions of the leaves be marked upon it. Then if radii be drawn from the centre to the positions of the leaves, the angle between those drawn to any two successive leaves will be two-fifths of a whole circumference, or of 360°; *i.e.*, it will contain 144 degrees. From this fact, the fraction $\frac{2}{5}$ is called the *angular divergence* of the pentastichous arrangement of leaves. An observation of some importance may be here conveniently made; viz., that

* Leaves will occasionally be found grouped in threes or some higher number: they are then said to be *whorled* or *verticillate.*

each coil (*i.e.*, the circumference of a circle) contains *three* leaves; this same number is invariably true for all other arrangements (excepting the $\frac{1}{2}$, such as the leaves of the flag).

Let another example be taken. Suppose it to be a sedge (*Carex*). Here the fourth, seventh, tenth, &c., leaves will all be found arranged vertically over the first; the fifth, eighth, eleventh, &c., over the second; and the sixth, ninth, twelfth, &c., over the third. Hence there will be only *three* vertical rows of leaves, and the name given to this arrangement is consequently *tristichous*. Moreover, it will be observed that there are but *three* leaves in each cycle, and that the cycle completes but *one* coil or circle in passing from any leaf to the next immediately over it: so that by adopting the method given above, of representing this arrangement by a fraction, the fraction will be $\frac{1}{3}$, and the angular divergence will be $\frac{1}{3}$ of 360° or 120°.

By extending such observations as these, we should soon discover other arrangements of leaves to exist in nature; and we should find that their angular divergences are equally capable of being represented by fractions. Thus, in the garden flag (*Iris*), the leaves are on opposite sides of the stem, but are alternately arranged, as no two stand at the same level. This, therefore, will be represented by $\frac{1}{2}$, because in passing from the one leaf to the next, an entire semicircle is traced, and from the second to the third another complete semicircle; so that the third leaf (which commences the next cycle) is over the first. This arrangement is consequently called *distichous*, as all the leaves on the stem will be in two vertical rows, and on opposite sides of the stem. In another kind, a cycle will coil *thrice* round the stem, and contain *eight* leaves; hence $\frac{3}{8}$ will represent the angular divergence. Another is found to be $\frac{5}{13}$, and several more exist.

If the fractions thus constructed from actual examination of plants be written down in succession according as the numerators and denominators increase, they will be seen to form a series with remarkable connections between its component fractions. It will be as follows:—$\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{5}$, $\frac{3}{8}$, &c. It cannot fail to be noticed that the sum of any two successive numerators, or of any two successive denominators, forms that of the next fraction respectively, so that we might extend this series indefinitely; thus: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{5}$, $\frac{3}{8}$, $\frac{5}{13}$, $\frac{8}{21}$, $\frac{13}{34}$, $\frac{21}{55}$, $\frac{34}{89}$, &c. It will be also observed that the numerator of any fraction is the same number as the denominator next but one preceding it. There yet remains one more remarkable connection between them, viz., that these fractions are the *successive convergents* of the *continued fraction*.

$$\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\&c.}}}$$

That is to say, if we reduce, by the ordinary rules for simplifying fractions, the portions

$$\frac{1}{2}, \frac{1}{2+1}, \frac{1}{2+1}$$

$$1 \quad 1+1$$

$$1$$

and so on, the resulting fractions will be the same as those given above.

I have said that the above series of fractions represent the arrangements which exist in nature, and it is not usual to find any species departing from the arrangement which may be characteristic of it; in other words, the phyllotaxis of any species is almost always constant to that species. The following are illustrations :—

- $\frac{1}{2}$. *Iris*, or flag. The glumes (chaff) of all grasses. Some orchids.
- $\frac{1}{3}$. *Carex*, or sedges. Leaves of several grasses.
- $\frac{2}{5}$. Oak, hawthorn. This is one of the commonest arrangements.
- $\frac{3}{8}$. Holly, white lily, greater plantain. A common arrangement amongst mosses.
- $\frac{5}{13}$. *Convolvulus tricolor*. Many orchids. Male fern.
- $\frac{8}{21}$. Scales of spruce fir-cone. Ribwort plantain (*Plantago lanceolata*). *Yucca*. Some mosses.
- $\frac{13}{34}$. Hoary plantain (*Plantago media*).

As an example of exceptions to constancy, the young student will find the common laurel (*Prunus lauro-cerasus*) instructive; for when the branches grow out horizontally the leaves are in two opposite rows, *i.e.*, distichous ($\frac{1}{2}$); but when the shoots are vertical the leaves on them will be $\frac{2}{5}$. This shows that the arrangements *can* vary to suit the requirements of the plant. The different arrangements of the ivy, when growing against a wall and shooting out freely above it, should also be noticed.

G. Henslow.

LODDON LILIES.

On the left-hand side of the road leading down to the river is a steep bank divided from the pathway by a little, damp ditch. This bank being sheltered from the rough winds, and yet receiving a large share of sunshine, is adorned early in the season with luxuriant patches of common wayside weeds. One may gather a bunch of these wild blossoms here when the more exposed situations have scarcely a flower to offer. Therefore, I always come to the spot with expectations, and, providing the season is not unusually backward, I am seldom disappointed. Common though the flowers are, they well deserve notice and admiration. Though small, even insignificant in

many cases when taken singly, they form in the aggregate such glorious displays of colour and contrast that they could scarcely fail to awaken the praise of the most thoughtless passer-by, could he or she be induced to glance for a moment at their beauty. Very few, however, do look at the flowers. Almost all those who go along the road are desirious of getting from one point to another as quickly as possible, and they are so wrapped up in their own affairs as to be quite indifferent to the feast of colour that Nature strews so near them with such a bounteous hand. It is difficult for them to avoid brushing the dust from the silver-weed leaves with their feet as they hurry forward, yet, strange to say, nine out of every ten who pass never even glance at the flowers on the bank.

The silver-weed is the advance guard or pioneer of wayside vegetation ; it fears neither dust nor danger from passing traffic, but thrusts its long suckers far beyond the boundary marked out by the grass. These suckers catch the eye and lead the glance from the dust of the highway to dwell upon the beauties of the bank and hedgerow. Forcing themselves upon the notice more from the prominent position that they occupy, near to the close-cropped thorn hedge, than from any special beauty that they possess " Jack-in-the-hedge " plants flourish exceedingly. The tall luxuriant stems of pea-green leaves, topped by scanty umbels of tiny white flowers, cannot well be over-looked ; nevertheless the plant is not a favourite.

Lower down, there are vast clumps of the red dead nettle, making patches of dull crimson in this wayside tapestry ; and again, close by are the tall white " archangels," many of them weighed over by big clinging bumble-bees, which are unceasing in their attention now that the weather has really become warmer.

Further along, the charming celestial blue of the germander speedwell is a prominent tint ; the colour seems heightened in intensity by contrast with the white stellaria flowers growing near. The speedwell may justly claim a moment's special notice—for was ever a blue more lovely or perfect than is the colour of its blossoms ? Possibly honours must be divided in this respect with the summer chicory, but with this exception it would be a hard task to discover a more gloriously satisfying tint among the flora of our islands. The blue of the speedwell is in itself a sufficient reward for many a mile of dusty road traversed. Again proceeding, a fresh plant seems to sue for notice at every step. Trailing pink vetches, wild strawberry blossoms, ground ivy, delicate yellow bank buttercups, and wild heartsease or pansies, all these and many more are seen dropped carelessly from Nature's hand, here many, there few, without design or order. And the beauty is not one whit lessened by the lack of arrangement. Nay, it is rather enhanced, for the wildness of the whole gives an added charm to each leaf and blossom. At times an involuntary sense of wonder fills the

mind when brought face to face with Nature's colouring. She fears neither bold contrast nor does she spare her tints. On every side as the summer advances we may see new proofs of her marvellous recklessness. Here a meadow golden with buttercups; there an unproductive cornfield, scarlet by reason of the poppies which are so abundantly interspersed amongst the scanty stalks of the cereal. Vast tracts of one bright colour are succeeded immediately by others quite as gorgeous, and yet none of the tints jar upon the feelings, nor do they seem out of place in any sense of the word. How different is this to many of man's artistic attempts! He exercises infinite care and thought in the blending of colours and shades, and even then often fails to please. The flowers spring just where they will, and yet the result of their combined tints only awakens feelings of satisfaction and admiration.

In the ditch below the bank there are still more plants—clumps of forget-me-not, spikes of self-heal, and the tiny land-cress. A fragrant perfume reveals the spot where young pepper-mint plants are springing: these and the glossy-leaved brook-lime, have scarce overtopped the grass as yet, and will not flower for weeks to come.

But numerous as are the spring blossoms, they by no means represent the only objects of interest that this bank reveals to the careful, searching eye.

Shining red ladybirds, bearing six black spots upon their broad backs, may here and there be seen upon the surface of a leaf. The bright points of colour that their presence produces catch the eye at once. The tiny creatures have crawled up from the ground below to bask in the welcome warmth of the sunshine. For the same purpose a little brown lizard has ventured from the crevice in which he has passed the winter months. He has come to a little spot of bare sun-dried earth, and is so absorbed in enjoyment of the warm rays as to be totally unconscious of a little sand thrown in his direction. Not until the end of a walking-stick almost touches his delicately tapering tail does he consider it necessary to bestir himself, and to glide into a neighbouring grass-tuft.

Early in the year as it is, innumerable insects may be seen, both amongst the flowers and on the pathway. Far more than I can count or name are here. And all these creatures seem so glad and full of contentment! Their welcome to spring is so unmistakable that one cannot but share some of the joy that the very fact of their existence expresses so plainly.

Blot out fear, and that impulse which is ever directing the glance onward to the dark, impenetrable mist of futurity—and who could possibly dwell in this world and lack happiness? Contemplation, though responsible for a fund of happiness, is also answerable for an equal amount of woe. Could we, like the birds and flowers, live for each moment as it comes, and for that moment alone, we could scarcely fail to be glad.

Arrived at the little riverside inn, the best available punt is chartered—for the first water excursion of the season is in search of snowflakes, or "Loddon Lilies," as the lady at the bar terms them, with a glaring display of local pride (*Leucojum æstivum*). Nor are the blossoms unworthy of this high esteem, for they are by no means universally common, and their beauty is undeniable. But they are plentiful enough in all conscience by the banks of the Loddon. In their season enough and to spare may be had by all comers.

The flowers closely resemble very large snowdrops, supported upon stalks two or more feet high: the leaves are lance-like and narrow. The plants spring in dense clumps all along the river bank, often out of the very water itself. When the blossoms are at their best—thousands of white star-like points against the dark olive-green background of the leaves—one might roam far before finding a prettier sight.

What an intense joy the water awakens! To move upon its surface even in a heavy punt, with odd sculls, is a pleasure. The sense of motion and power, the gentle rippling as the water parts at the bows in shining lines, the slowly passing panorama of the bank—all these details go to make up that incomparable delight that the river is capable of inspiring.

Above and around, adding a glory everywhere by its presence, is the sunshine. The warm light seems to penetrate the very soul, dispelling for a time by its presence all those gross and sordid thoughts which bind men to earth as the ship is held by its anchor to the ocean bed. Here, in the clear, unsullied light, the mind cannot lend itself to such meditations; instead it is occupied with a great gladness—the joy of living. This gladness is not unmixed, however, for with it comes an involuntary craving for something more, something unknown and unattainable. Perfection is all around, yet the whole being seems to stretch forth towards an invisible loveliness and meaning, as different and as far removed from the actual shapes of beauty, as is the soul from the body in which it finds a temporary home. Grand music, lovely flowers, perfection of form—all these please, but the soul cries aloud for still more beauty. For a while the delight of life and sunshine hold the mind as with a tender embrace, but ere long the senses are drawn to dwell upon the familiar sights and sounds of the river. There are the old pollard willows, just decking themselves once more in their spring garb of narrow green leaves. From niches in the moss-grown trunks tufts of dark fern-leaves show the last year's growth of polypodies, which by some means have attained to these exalted positions.

The alders, too, stooping lovingly over the waters, are likewise putting forth their leaves. These are moist and crumpled yet as unstarched linen, but before long the influence of sun and air will work miracles on their behalf, and they will then appear as stiff and glossy as heart could wish. The banks are screened

by the snowflakes, but beyond in the meadows there are still more flowers. In truth, the memory of the wayside bank is in danger of being effaced by the profusion and beauty of these riverside blossoms.

Here the yellow cowslips, gently quivering in the breeze, are diffusing their delicate fragrance, thereby adding a unit to the delightfully sweet country smell which permeates the warm air of springtime. Delicately tinted, lilac cuckoo-flowers are in another spot, and with them a few scattered "turkey caps," as children term the chequered fritillaries.

Under shelter of a hedge a few blue hyacinths remain, running to seed for the most part, to be sure, but still making a bright patch of colour.

The marsh marigolds, growing in the ditches and runnels which intersect the fields, likewise passed the full height of their beauty a week or more ago, but the sepals which at close quarters appear somewhat old and worn still look rich and golden when seen from a short distance.

From both banks the sedge birds pour forth their chattering melody, and a chaffinch is monotonously repeating his short song from the elevated position of a solitary riverside oak.

Some peewits cry high in the air, where they may be seen carrying out their rough-and-tumble evolutions; and sweetest of all, from a distant coppice just where the ground begins to rise, the clear notes of a nightingale are distinctly audible.

The creatures by the river-side are as joyous as those whose dwellings are near the lanes and highways. All, too, seem to bear the same message to the heart.

A. H. Bastin.

REVIEWS AND EXCHANGES.

On Buds and Stipules. By the Right Hon. Sir John Lubbock, Bart., M.P., F.R.S. With 4 coloured plates and 340 figures in the text. Kegan Paul, Trench, Trübner, and Co. (International Scientific Series.) Price 5s.

Popular science in the best sense of the term, that is, science intelligible to the general reader, is always presented to us by the International Scientific Series. The volumes in this collection are the work of specialists, chosen without regard to nationality, and such is the division of labour in modern science that, although there are several cases in which two books are from the same pen, Sir John Lubbock is the only writer whose versatility is so great that no less than four volumes of the series are by him. In addition to the present work, these deal with such divers subjects as Ants, Bees and Wasps, the Senses, Instincts, and Intelligence of Animals, and Seedlings, and they rank among the most popular volumes of the series. As Selbornians all these works of our President are of peculiar interest to us, embodying as they do records of systematic observation which are of just such a kind as those made by our great master Gilbert White himself. Buds and stipules are familiar objects to all of us, especially at this time of year; but many of us have probably never tried to determine the precise nature of the scales in any particular winter-bud or to answer Vaucher's question as to the reason for the presence or absence of stipules. The multitudinous observations recorded by our President can in almost all cases be readily verified or added

to by anyone, with no very special amount of botanical knowledge; and, as we cannot imagine a better training in the art of seeing than such an attempt with this book in hand during the present Spring season, we the less regret that our limited space forbids our selecting any particular examples of Sir John's method.

YOUNG SHOOT OF TULIP-TREE, 1½ nat. size.

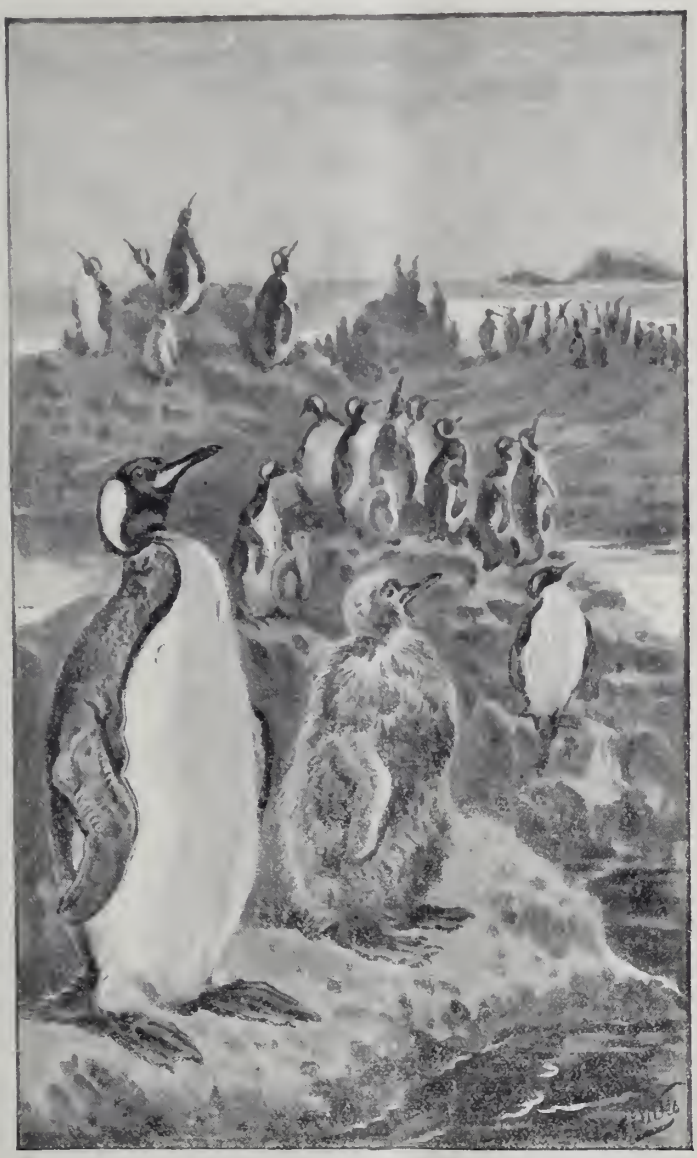
The Tulip-tree (*Liriodendron tulipifera*), of the young shoot of which we are able, by the kindness of the author and publishers, to present an illustration, is a case of great interest, the unravelling of which has been one of the author's special achievements; and when we say that this is only one among ten or more drawings of this one species, it will be realised that this is one of the most fully illustrated volumes in the series.

The Dawn of Reason, or Mental Traits in the Lower Animals. By James Weir, Jun., M.D. New York. The Macmillan Company. Price 5s.

This little work is of much the same scope as Sir John Lubbock's "Senses, Instincts and Intelligence of Animals;" but, though the author modestly speaks of it as dealing mainly with insects, he by no means neglects to illustrate his theme from other animals, both higher and lower—far lower. He gives us a perfect store-house of marvellous tales of animal intelligence, most of them at first hand, clearly narrated in the American language. Though we are not disposed to altogether deny his main thesis that "mind in the lower animals is the same in kind as that of man," or that "intelligent ratiocination performs an important *rôle* in the drama of their lives," we hesitate to accept all his psychology, as we think that in some cases he evinces far too imaginative a faculty of reading conscious determination in what are probably the simplest of reflex actions. We are not yet prepared to admit "a well-developed nervous system" in *Stentor*, and are reminded in this part of the work of M. Binet's unfortunate "Psychic Life of Micro-organisms." The words *letisimulation*, from *letum*, death, and *simulare*, to feign, for "playing 'possum," and *tinctuwutation*, for the habit familiar in the case of the chameleon, seem useful, and one of the original features of the book is the claim that this latter and the sense of direction, or so-called "homing instinct," are sensual and not instinctive. Though marred by a certain "cock-sureness," the book is certainly one of great interest and demands careful consideration.

The Strength and Decay of Nations. I.—Forestry. II.—British Forestry. Being two essays with notes. By Giles Andrew Daubeny. London: Simpkin, Marshall. Price 1s.

Anyone who is interested in the question of forestry—one of vital importance certainly in many parts of our empire—should certainly procure this powerfully-worded plea by Mr. Daubeny, a portion of which appeared in NATURE NOTES.



ROOKERY OF KING-PENGUINS *(Aptenodytes patachonica.)*

Wonders of the Bird World. By R. Bowdler Sharpe, LL.D., F.L.S., with illustrations by A. T. Elwes. Wells Gardner, Darton and Co. Price 6s.

Glad as we are to have this volume from the pen of such an authority as our Vice-President, Dr. Bowdler Sharpe, many are those who will share our regret at the cause of its appearance—Dr. Sharpe's compulsory abandonment of the lecture-

platform. It is just those delightful bye-ways of ornithology, such as nest-building, courtship and dancing, decoration, sexual and mimetic, migration and distribution, which find no place in Mr. Evans' volume recently reviewed in these columns, that furnish the chief topics of Dr. Sharpe's charming dissertations. Space does not allow of our giving any adequate quotation; but many of our readers may be glad to know that in a chapter on "Parasitic Birds" they can read here *in extenso* the accounts of the ejection of its companion by the young cuckoo, as given by Mrs. Hugh Blackburn and John Hancock. As to this

LITTLE BITTERN IN REED-BED. (Shewing protective resemblance.)

matter we can only "say ditto" to Dr. Sharpe's remark, that "It seems rather extraordinary that the details of a cuckoo's life should not all have been mastered considering the number of good field naturalists which abound in Britain, but there is much which is still mysterious in the ways of this species, and many things which require explanation." Considering the numerous whole-page and other illustrations by Mr. Elwes, many of which are excellent—and of which, by the courtesy of the publishers, we are able to give two examples—and the general get up of the volume, we can only pronounce it a marvel of cheapness.

Received.—*Board of Agriculture Leaflets:* No. 54, The Spotted Flycatcher (*Muscicapa Grisola*), and No. 55, The Swallow (*Hirundo rustica*), both illustrated and gratuitous; *Science Work*, No. 3, with illustrated supplement; *Animal World, Animals' Friend, Humanity, Our Animal Friends, The Naturalist, The Irish Naturalist*, and *Knowledge* for April; *Society for the Protection of Birds, Eighth Annual Report*, with *Summary of the Wild Birds Protection Acts; Essex Naturalist*, vol. x., Nos. 19—24; *Victorian Naturalist* for February; *American Society for the Prevention of Cruelty to Animals, Thirty-third Annual Report; Dundee Free Library Report; Biographical Index of British and Irish Botanists:* Compiled by James Britten, K.S.G., F.L.S., and G. S. Boulger, F.L.S., F.G.S.; First Supplement (1893-97).

NATURAL HISTORY NOTES AND QUERIES.

Canadian Natural History.—W. S. Wilkinson, of Woodstock, Ontario, after writing about Canadian Archæology, says :—

"However, I don't trouble myself much with these things. I get more satisfaction and enjoyment out of snakes, 'bugs' and birds, and it is a source of great pleasure in my tramps to watch and note them. This is a poor season of the year for natural history. The country is almost dead so far as animal life is concerned, and in this respect is much more so than it used to be forty years ago, when there was a larger area of timber lands. Then there were many northern or resident woodland species, such as woodpeckers, jays, and titmice, crossbills, &c., but now you scarcely see a bird of any kind. The shelter of the woods is getting less every year, and consequently the food of these birds is scarce, so they live the winter through further north, in newer and more woody districts. I often take a tramp to Maple Bank, and during some trips this winter I have seen absolutely nothing in the way of birds. But perhaps the cause of loss in winter gives a gain in summer, as I am sure there are many more birds at that season than formerly. A good many new species, that live out here in the open in preference to the thick woods, have come in since I first knew the country. Some of our birds are grand songsters: perhaps the sweetest is the wood thrush. Others are more noted for their beautiful plumage than for their singing. Maybe you remember seeing some of them—the yellow-bird, or goldfinch, the blue-bird, and brightest and gayest of all, the scarlet tanager, with his bright, scarlet body, and black wings and tail. This morning I heard a crow 'cawing,' and being the first and only one I have noticed all winter it struck me as a very pleasant sound. Some seasons quite a flock stay here all winter. The 'English' sparrow, however, we have always with us. Storm and cold seem to have no effect whatever on him; and he is really an unmitigated nuisance in the summer-time, fighting with, and driving off birds that we would much rather have, pulling their nests to pieces and otherwise making himself disagreeable. There is a heavy 'trumpet-vine' over our front door porch, and Maggie has great trouble in keeping the steps clean because of the little rascals. A robin, or rather a pair of them, build their nest in the vine every summer, and make as much mess as the sparrows, but they are privileged characters, and we just clean up and say nothing about *them*. The sparrows have found their way a long distance out West. A year ago last fall, I noticed a small flock in Deloraine, about one of the grain elevators. Last year they seemed to be all over the country (Manitoba). They took possession of G. P.'s new barn long before it was finished, and started housekeeping. Pulling down their nests and destroying their eggs had no effect on them at all, they would start rebuilding at once, and in the same place, and with the old material, if it was laying around. They stand the blizzards, and 40° below zero weather, and thrive on it, in fact I thought they looked larger and plumper than the Eastern birds. Well, that is surely enough about sparrows. A little about the weather and I must stop. Our winter has been a strange one so far, with alternate changes of cold and mildness, which is not at all pleasant. We had a heavy snowfall early in the season, which disappeared shortly after Christmas. Since then we have had no sleighing, but at times, bitter cold weather. This weather report is only for this section. In some places they always have from two to five feet of snow and steady cold the winter through."

February 2, 1899.

Cannibalism of Dormice.—I would ask Mr. Dighton if he supplied his dormice with plenty of water to drink? If not, the apparent act of cannibalism he mentions is easily accounted for, one of the dormice having killed the other for the small amount of moisture to be obtained to slake its parching thirst. I know that dealers in pet dormice state to their customers that these animals do not require water, but a more cruel statement could not be made. All animals must have water or obtain moisture from food to be able to exist. One often hears of pet rabbits devouring their young, and this is frequently caused from want of water. I know of no greater cruelty than to keep any pet animal of any

kind without a supply of water always at hand. A pet lizard (*Lacerta viridis*) which I have now had for several years delights in a bath in the hot sun.

ENOTS.

London Birds, 1898.—The Battersea Park song thrushes were apparently a little ahead of their Kensington neighbours, which, Mr. Macpherson remarks, did not sing until January 5, for walking through the park on January 2 I heard several in good song: the missel thrush, however, I did not hear until the 23rd of the same month. Every year a few of the black-headed gulls on the river assume the brown hood weeks in advance of their fellows, and these, too, are not invariably old birds, but sometimes birds of the previous year. I noted one on January 15 which, so far as could be seen with a good field glass, appeared to be in perfect summer plumage.

Passing along the Kensington Park Road on the morning of March 31, I noticed a crowd of people outside the railings of a front garden, and hearing frantic chirpings I pushed my way through, and found the attraction to be one of the most determined bird fights I have ever witnessed. Two cock sparrows were fighting fiercely, not in the usual way, here, there, and everywhere, over half an acre of ground, but locked together more after the style of two trained bulldogs than anything else. The stronger bird had forced his opponent on to his back, and was holding him tenaciously by the throat, taking little notice of the interested crowd. For nearly three minutes by my watch the pair were interlocked, each wrestling for the mastery, but just as I thought the undermost bird, from his feeble chirps, must be getting somewhere nearly choked, the victor suddenly released his hold, and both flew away apparently little the worse.

Battersea Park, last year, bred two curiously marked blackbirds, one heavily splashed about the head, neck, and shoulders; but the other, a very handsome bird, was pure white, with the exception of just one black feather in its tail. Should this latter bird survive another month it will be interesting to see whether this natural-coloured feather will be reproduced as before, or give place to a white one.

A pair of moorhens at the Dell in Hyde Park built a nest on the water, quite away from the bank, among the lilies, but partly supported by, and anchored to, the sticks placed among the latter to keep the ducks away. They successfully hatched out a brood of seven from this nest, although the sitting birds were in full view of the public throughout the day. A pair of wood-pigeons were building in this vicinity as early as March 13.

The common wren was not very plentiful in Battersea Park during 1898, but I heard it singing there on several occasions in the month of April. The reed-warbler, however, is a very regular summer visitor, and several pairs nested in the park as usual; fully fledged young were being fed by their parents on July 8.

By the middle of August, presumably having finished breeding operations, a few gulls began to appear on the river again, increasing in numbers as the season advanced. On August 14, and subsequent dates, until October 23, I saw a linnet by the river bank: to all appearances this was the same bird, but of course it was impossible to make certain. Although but a few pairs of lesser grebes appear annually in St. James' Park, I was able by September 4 to count upwards of sixteen on the water, and there were probably others which escaped my notice at the time. These all left the park for the winter, but I noticed one or two until well into December.

Meadow pipits were feeding by the edge of the Battersea reservoir on September 25, and on October 9, a pair of goldcrests in company with blue and cole tits were busy inside the park. The goldcrest is not common in our London parks, but it can be found at any time about the woods and coppice of Wimbledon Common just a few miles to the south-west.

The strange behaviour of a small flock of starlings crossing and recrossing the river, caught my attention while walking along the Chelsea Embankment on November 27, and looking at them more closely I found they were dipping down to the water and feeding from the surface, exactly as the gulls all around them were doing. In a footnote to a short account of this occurrence that appeared in the *Field* of January 14, 1899, the editor remarks that this curious aquatic trait was observed some years before in the same locality. As an instance of the

genial weather of last autumn it is worth recording that a few blooms still lingered on the rose-bushes in Battersea Park until well into November.

A hen pheasant seen at the back of the flower walk in Kensington Gardens on December 25 is my last bird note for the year. This bird, from its tameness, was evidently not a genuine wild visitor.

12, *Fentiman Road, Clapham Road, S.W.* W. NAUNTON RUSHEN.

Cuckoo Myth.—I doubt if Mr. Joseph Collinson's method of treating this matter, as exhibited in his recent letters, is persuasive. He postulates, as I understand him, the absolute impossibility of the ejection of the native nestlings by the young cuckoo. If that be right the question is of course settled. The credibility of professing witnesses becomes irrelevant, and the evidence of all the Fellows of the Royal Society and of the Bench of Bishops would be of no avail. Those who say that they have seen the feat performed must be either the victims of illusions or liars; and Mr. Collinson seems to choose the harsher alternative. But could such a postulate be established? Do the conditions of the case allow it? And if it could, has it been established? No evidence of "observers" could convince us now of the existence of such phenomena as the mermaid in her fabled form, or the Vegetable Lamb of Tartary. To be convinced thereof we should have to believe that a new earth, if not a new heaven, had begun. There would, also, be limits to our belief, or credulity, in the powers of the young cuckoo. No observer, however worthy, would make us believe that it could lift a ten pound weight. But the compass of the particular question must surely lie within the region of uncertainty so far as results of *à priori* reasoning are concerned. Not one, but all the parts of the cuckoo must be considered; its neck as well as its back; its wings as well as its legs. Also the relation, in the supposed operation, to the structure and behaviour of the fellow-nestling, and to the form of the nest. I am not aware that in the simplest case muscular strength can be accurately measured by dissection. I should submit, therefore, that though it may have been a reasonable opinion that the young cuckoo could not practice ejectment, it would be presumption to assert the impossibility of such a performance. The question is, I think, to be decided by testimony only. The credibility of the testimony is another matter, which I hope to refer to on a future occasion. J. L. OTTER.

The substance of Mr. Joseph Collinson's note on page 76 appears to be that all men are liars and some of us especially so. Why? Because we have happened to see (and may believe our eyes I suppose) that which Mr. Collinson has not yet seen, but may very shortly, if he will find a robin's nest with a cuckoo's egg in it, and watch the young cuckoo daily, as I did. I rely on nature, not "theory."

JAMES HIAM.

In the last number of NATURE NOTES a correspondent, writing under the above heading, ventures "to deny the accuracy" of Dr. Jenner's story of the young cuckoo ejecting the eggs or young of its foster-parents from the nest, alluding to it as a story "which Jenner accepted the parentage of." But Mr. Harting in "Summer Migrants," page 233, states that "Dr. Jenner says positively (*Phil. Trans.*, vol. lxxviii., p. 225), 'I discovered the young cuckoo, though so newly hatched, *in the act* of turning out the young hedge-sparrow.'" Even supposing that Dr. Jenner had given this story on hearsay he is not the only authority for the tale. In the introduction to Montagu's "Ornithological Dictionary," that author gives an account of the experiments he tried with a young cuckoo in order to test the truth of Dr. Jenner's statement. He says, "At five or six days old I took it to my house where I frequently saw it throw out the young swallow for four or five days after." Are not these trustworthy authorities, they both being eye-witnesses of the fact, and men whose words are worthy of belief? On such evidence as this may we not accept it as proved?

E. S.

A Pied Rook.—I do not know whether pied rooks are common. Amongst the flock of rooks which are in the habit of assembling daily on my premises for food, there has been for at least three or four years one conspicuous through having the exterior feathers of its wings perfectly white. When flying it might almost be mistaken for a magpie, except that it is larger. It is more shy than the

rest, apparently conscious that it attracts attention, and it seems never to have a mate. Yarrell (vol. ii., p. 100) writes of such varieties being "generally found to be smaller and weaker birds;" and continues, "as these young birds increase in age, and gain constitutional powers, the secretions become perfect, and the plumage assumes its natural colours." My experience of my friend, "white wings," as the children call him, does not bear out the above remarks, for the bird appears just the same as it has always done, and it is certainly neither small nor weak. Lest he should be shot to adorn some woman's hat, I will ask you to give neither name nor address.

April 9, 1899. H.

Strange Situation for Robin's Nest.—An old salt jar, having been used to hold flowers for decorating a newly-made grave in our churchyard, was found yesterday, lying on its side under a small tree close by, containing a robin's nest with three eggs. The nest is within a few yards of a public footpath through the churchyard, with seventy children passing to and fro to the school hard by. Whether the robin will bring up its family under the circumstances seems doubtful! I have six thrushes' nests in my garden; but three made before the cold spell of last month have been deserted, apparently on account of the cold.

April 8, 1899. A. F. CURTIS.

Little Twitters.—The merry little chiffchaff has been late in arriving this spring, being first heard April 7, at Himbleton, Worcestershire. The last redwing I saw was one straggler on March 28, last year; last seen March 29. Two pairs of robins have nests in tomato-tins in my garden, very snugly built and out of danger from ground enemies. Stock-doves were sitting in two houses put up in trees in my fields at the beginning of March, and one pair should be soon leaving the nest. A pair of magpies have taken about five weeks to build a nest this spring.

The Wren's Nest, Redditch. J. HIAM.

Wood-Pigeon.—The same observer who informed me that he had seen a wood-pigeon feeding its young on December 8 last, writes to say, that on his lawn a pair of wood-pigeons were reared and had flown on March 11. No doubt these had the same parents as the former brood.

Market Weston, Thetford. EDMUND THOMAS DAUBENY.

Hedge Sparrow.—On my lawn there is a hedge sparrow with a cream-coloured tail. This peculiarity is not likely to endanger its life here.

Market Weston, Thetford. EDMUND THOMAS DAUBENY.

Tameness of Birds.—The following true incidents may perhaps prove of interest. Not long ago, I was staying with a friend at Eastgate, Chichester, and while there had daily opportunity of witnessing an extraordinary confidence on the part of a robin. It was a young female bird, and had since the previous September voluntarily attached itself to the house, flying in and out of the windows whenever opened, and fearlessly taking crumbs from the lap or hand of any of the inmates. It invariably spent the night indoors, its favourite roosting place being an unused hall lamp, where a perch had been placed for its special delectation. About the hour of sunset it would appear in front of every window in succession, until attention having been attracted towards it, it at length obtained the desired admission. Then it would fly off to its lamp, and as a rule settle quietly down for the night. Its exceeding tameness was perhaps the more extraordinary, as in the course of the winter it had somehow managed to injure its claw so badly it was that at last found necessary to amputate it; but even this did not serve to destroy its friendly confidence in the human race. About a week ago it suddenly disappeared, and has not since been seen or heard of. Whether it is busily engaged in building a nest, or has fallen a victim to a hungry cat, or has (and such cases alas! do sometimes occur) been done to death by the other robins, is not so far revealed. Its fate is still a mystery. Perhaps your readers may be able to make some suggestion on the subject.

28, *St. Aubyns, Hove.* R. V. BALLARD.

Rooks.—Can any reader furnish me with information as to the indigenous character of the rook? I read that Æneas Sylvius, afterwards Pope Pius II., visiting Britain in 1453 says, that rooks had been recently introduced, and that the trees on which they roosted and built belonged to the King's Exchequer. Jerome Cardan, who came to Scotland and England in 1552, alludes, in his *De Subtilitate*, to the war of extermination waged against these birds to check their inordinate breeding.—Ed. *N.N.*

The Toad.—I have kept a toad in a conservatory since last August, and not only did he bury himself for his winter's sleep, but since February when he woke up, he has buried himself completely every evening, except for a small breathing hole, which is generally hidden by a dead leaf placed over it apparently to prevent discovery. On Sunday morning, April 2, soon after he had emerged from his hole, I noticed that one side of his back seemed much brighter than the other, and on close examination I found I had caught him in the act of changing his skin. The right hind leg and side were already in new apparel, and the process of changing had begun with the left hind leg as well. By contortions of the body the skin was brought down in loose folds over the foot, which was then thrust forward under the left forearm, and the hind leg being drawn back the skin was pulled off inside out like a glove. After a short period of resting, the skin of the left forearm was loosened from the body by more contortions, and then seized by the mouth and gradually drawn off. As it came off it was thrust into the mouth by the other hand bit by bit, till the left hand was free, when the whole was swallowed, with apparently some difficulty, taking about five minutes. After another rest the right foot was dealt with in the same manner and the skin of that side swallowed. In neither case was the skin rolled up first as is usually stated, but it was pushed into the mouth as it was stripped off. During the whole process he protruded and retracted his eyes, and afterwards climbed up on the window and sat in the sunshine for about two hours.

Chesterton, Bicester, Oxon. G. C. Hughes.

What is a Finnock?—This question has recently been taxing the legal acumen of the Sheriff's Court in Aberdeen. It seems to be admitted that "finnock" is the Scottish equivalent for the English "whitling"; but, while the Fishery Inspector asserted that it is only the young state of the sea trout (*Salmo trutta*), the anglers claim that it is a distinct species. The sheriff took refuge, like Sir Roger de Coverley, in that convenient verdict "not proven."—Ed. *N.N.*

SELBORNE SOCIETY NOTICES.

Donations towards Reduction of the Deficit.—The Council acknowledges with thanks the receipt of the following donations.—F. Crowley, Esq., 13s. 6d. (also subscription of 7s. 6d.); J. H. Bowman, Esq., 32s.

Council and Committee Meetings.—The next meetings of the Council will be held on Tuesdays, May 2 and June 6, at 5.30. The Magazine and Leaflet Committee will meet on Tuesdays, May 16 and June 20, at 5.30.

Branch Payments for 1898.

		Payments for Magazines.	*Contributions.*
Already acknowledged ...	...	£64 17 3	23 12 0
Bedhampton (Havant) ...	(subs.)	0 15 0	—
Clapton (Lower Lea Valley) ...	...	5 10 6	(don.) 2 2 0 1 5 0
Croydon	...	4 6 6	0 17 9
Ealing	...	6 1 4	0 15 6
Kensington	(subs.)	12 12 6	—
		£94 3 1	£28 12 3

NEWS FROM THE BRANCHES.

Birmingham and Midland send a fairly satisfactory Annual Report, especially in the matter of prizes to schools. Two answers quoted are too good not to be repeated here:—"We must not close up swallows, because we have no atmosphere in this country." "We see some lads with sticks knock everything down, beautiful or not; how bad the country looks, and how grieved Mr. Ruskin would be; you never see a young lady knock down beautiful flowers, she goes on gentle, and says, 'How pretty.'"

Proposed Manchester Branch.—Dr. Graham Renshaw kindly promises to mention the aims of the Society at all his zoological lectures.

FIELD CLUB RAMBLES.

Saturday, May 6.—Abinger. Leave Gomshall Station on arrival of train leaving Cannon Street, 1.32; London Bridge, 1.34. Walk to Abinger Hammer, where late arrivals might join the party at 4. Then proceed along the Dorking High Road to Paddington Pond, and through Frogberry Lane to Lord Farrer's Rough. Miss Forster has kindly offered to provide tea at West Hackhurst. Guide, Mr. R. Harrison.

Saturday, May 13.—Oxshott and Claremont. Leave Waterloo, 2.17 p.m. Book to Oxshott. Single ticket, third class, 1s. 5d. Arrive Oxshott, 2.56. Walk by Fair Mile and Claygate to Esher, where tea will be taken. Return from Esher Station. Guide, Professor Boulger.

Saturday, May 20.—Purley Down and Purley. Book return to Sanderstead. Victoria, 2.30; London Bridge, 2.25; Thornton Heath, 2.51; East Croydon, 2.59. At Purley was the residence of Horne Tooke, who there wrote his "Diversions of Purley." Note large fossiliferous chalk-pit close to station.

Saturday, May 27.—St. George's Hills. Meet at Weybridge Station, 3.10. Train leaves Waterloo (main line) 2.29; Surbiton, 2.52. Does not stop at Clapham Junction. Route *viâ* St. George's Hills and Fox Warren to Park Farm, Byfleet, where tea will be provided. Guide, Dr. Willson.

Saturday, June 3.—Burnham Beeches. Paddington, 2.25; Slough, 3.3. Walk from Slough to Burnham Beeches *viâ* Stoke Poges. There will probably be public brakes by which to return to Slough, if desired. Guide, Mr. H. W. Ravenshaw.

ANSWERS TO CORRESPONDENTS.

Salcombe.—*Escallonia macrantha*, belonging to the Saxifragaceæ, a native of South America.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 114. JUNE, 1899. Vol. X.

ANNUAL REPORT.

(*Presented at the Annual Meeting, May* 31, 1899.)

The Council of the Selborne Society has pleasure in presenting to the members its Report for the year 1898.

In consequence of the interest roused in the neighbourhood of Sale, Manchester, owing to the recent lectures delivered by Dr. Graham Renshaw, in the course of which he drew attention to the objects of the Society, and to its magazine and leaflets, it has been decided to call a special meeting with a view to the formation of a new branch in the district.

The large number of congratulatory letters received of late from members are a testimony of the increasing value of the magazine during the past year.

The Council has been favoured with copies of all the excellent leaflets issued by the Board of Agriculture up to the present. Reference has been made to these leaflets from time to time in the magazine, and members are reminded that copies can be obtained on application to the Board of Agriculture. The supply of several of the leaflets issued by the Society having been exhausted, they have been reprinted. Amongst these may be mentioned that entitled "The Cruelty of Wearing Ospreys," by Mrs. Litchfield, which has been freely distributed by members without, however, apparently resulting in any reduction of the number of these feathers seen in ladies' bonnets.

Our President has succeeded in putting a stop to the use of the "ospreys" hitherto worn in some of the officers' head-dresses, having obtained an assurance from the Under-Secretary of State for War that a new plume, not made from the feathers of the egret, should be substituted for that hitherto used.

The resignation by Mr. Edward A. Martin of the honorary secretaryship of the Magazine and Leaflet Committee is a cause of much regret to the Council.

The Council is indebted to several of the members for additions to the library which is being formed. It should be stated that most of the books received are gifts of the Editor.

Under the Society's auspices, many lectures have been given during the winter months, and members are reminded that lectures will be arranged at any school, institute or society if a fair audience can be guaranteed. The lecturers give their services gratuitously, but the list of lecturers willing to speak at a distance from London is not so long as it should be, and the Council invites country naturalists to help it in this particular.

The following is a list of some of the gentlemen who have kindly assisted the Society in this direction :—Mr. F. W. Ashley, F.Z.S.; Professor G. S. Boulger, F.L.S., F.G.S.; the Rev. H. E. U. Bull, M.A.; Mr. J. S. Cooke, F.L.S., F.G.S.; Lieutenant-Colonel Coulson ; Mr. Alfred T. Dymes ; Mr. Edward A. Martin, F.G.S.; Mr. J. L. Otter ; Mr. Graham Renshaw, M.B., M.R.C.S., L.R.C.P.; Mr. James Saunders, and Mr. R. Marshman Wattson.

A report of the Natural History rambles under competent leaders, on Saturdays, organised by the Field Club in the summer of 1898, is appended. The details of route, time, &c., are published in *Nature Notes*. To these excursions all members and their friends are welcome.

Many County Councils have taken advantage of the opportunity now afforded to them of obtaining orders in extension of the general provisions of the Wild Birds' Protection Acts, for the protection of certain species and the eggs of certain species within their jurisdictions. The enforcement of penalties is left to the local authorities, or to private persons, and it is hoped that members will endeavour to aid in the administration (in the nature of the case somewhat difficult) of the orders obtained, as well as of the general law.

As the result of an important conference of the various societies and of members of Parliament in sympathy with their objects, at which the Selborne Society was represented, a Parliamentary Committee has been formed, entitled the "Amenities Committee," acting as representatives in the House of Commons. A circular on the subject will shortly be issued to the honorary secretaries of branches, and any member interested in the subject can be supplied with a copy on application to the Secretary of the Society.

A league, entitled "The Thames Preservation League," of similar societies has been formed, having for its object the preservation, for the public enjoyment, of all that tends to maintain the beauty and interest of the river. The Selborne Society has been invited to become one of its constituent bodies.

The South-Eastern Union of Scientific Societies held its annual congress in 1898, at Croydon, the chairman being one of our officers—Professor Boulger. The Selborne Society has become affiliated to the Union, and members are now entitled to the privileges attaching to members of the affiliated societies. This year's congress is to be held at Rochester, on May 25th to 27th, and delegates have been appointed to represent the Society at the meetings.

For a full account of the agitation now being carried on by the Croydon branch for the preservation of Crohamhurst from the builder, the members are referred to the pages of the magazine. It will be sufficient to say that at an enthusiastic public meeting held in Croydon on March 10, resolutions were unanimously adopted and forwarded to the Whitgift Trustees, to the effect that the meeting was strongly in favour of the acquisition of the whole of Crohamhurst for the people for ever, and hoped that, if it was not within the power of the Whitgift governors to present the Hurst as a free gift to the town, they would name such a moderate price for it as would enable the Croydon County Council to acquire it. The Selborne Society is deeply interested in saving all beautiful open spaces for the purpose of employing them as sanctuaries for bird and beast, and for the public use and recreation, especially in the outskirts of London, where the more attractive woodland hills and dales are in danger of falling into the hands of the speculative builder, and of being ruined by his bricks and mortar. The efforts of the Council are, therefore, more and more exerted in strengthening the hands of such local bodies as are public-spirited enough to attempt to rescue these threatened cases from the builder. In this way the Churchyard Bottom Wood and Golder's Hill Estate have been recently set apart as public recreation grounds, and Wolmer Forest has been secured as a bird sanctuary.

The beautiful scenery of Richmond has been so often threatened in recent years that the Council finds it necessary to keep a watchful eye upon this district. Last year, the attempted sale of Glover's Island occasioned much anxiety. During the year just ended the Richmond Town Council have taken steps to obtain a scheme to control Petersham Common, which it will be remembered the Dysart Trustees unsuccessfully sought power to enclose for building purposes in 1896. As Clause 3 of the scheme proposed powers to lop trees, remove seedlings, and thin underwood, which might interfere unduly with the natural romantic beauties of this common, the Council were represented by Mr. George H. Edwards at the Local Government Board inquiry held recently. They are glad to report that by a slight modification of the clause the danger has happily been averted.

The New Forest is again in danger. Notwithstanding the public opposition to the former Bill, another is being brought forward to permit of parts of the forest land being enclosed for various purposes, and every effort should at once be made if this most beautiful wild forest is to be saved.

A small committee has been appointed, consisting of representatives of societies interested in the reparation of Nether Hall Gateway at Roydon in Essex—a fine specimen of Tudor architecture. The Council has delegated Mr. J. E. Comrie, C.E., to represent the Selborne Society on the committee. Mr. R. Marshman Wattson attended, on behalf of the Society, the meeting called by Sir Benjamin Stone, M.P., of representatives of societies interested in the movement to procure photographs of buildings of historical and architectural interest.

The proposal put forward last year to increase the branch contributions

to the general funds of the Society, which was considered at a special general meeting, was eventually withdrawn in deference to the wishes of the committee of some of the larger branches.

For further details of the work of the branches, and of the general work of the Society, the members are referred to the pages of the magazine.

SELBORNIANA.

The President's Address, the Report of the Field Club Committee, the Report of the Annual Meeting, and the list of the newly elected officers for the year will appear in our next number.

Proposed Publication of Gilbert White's Naturalist's Calendar. — Our Treasurer, Mr. J. L. Otter, proposes, if a sufficient number of members subscribe, to print the diaries kept by Gilbert White from January, 1768, till his death in June, 1793, from the manuscript now in the British Museum. These diaries record daily observations of the thermometer and barometer, the first appearances of leaves, flowers, birds and insects, and many extraneous matters, only part of which entered into "The Natural History of Selborne." The work will form two large quarto volumes of about 700 pages each, and will be published at £2 2s. net; but Mr. Otter proposes to offer it to members of the Society sending in their names beforehand at cost price, viz., 30s. A circular, with a specimen page, will be issued shortly.

Postal Photographic Club. — Some members of the Avicultural Society are organising a Postal Club for the encouragement of bird and animal photography. The co-operation of photographer naturalists is invited. Address, Chas. Louis Hett, Hon. Sec. *pro. tem.*, Springfield, Brigg.

"Hawk" in the City.—We have reason to believe that the story of a "hawk" seizing a pigeon in Guildhall Yard, to which we recently gave currency, has no foundation in fact.

OBSERVATIONS FOR YOUNG BOTANISTS.

VI.—The Functions of Leaves.

ASSIMILATION.—The first duty which a green leaf has to do is to take in the carbonic acid gas from the air. The presence of this gas has resulted from the expirations of all living creatures, from all sorts of combustion, and from chemical processes going on in volcanic regions, where large volumes of this suffocating gas are sometimes poured out. It consists of one part of carbon (C) and two parts of oxygen (O) combined, and is represented thus (CO_2). This is a most refractory compound, and the only natural means known of decomposing it is the "chlorophyll granules" of green plants. These consist of minute globules of living protoplasm coloured green. The greening is caused by light, as plants, like celery, grown without light, remain white or yellowish.

Now the question is, What is the *force* which pulls the C and O asunder? It is *light;* and if a beam of sunlight be made to pass through a three-cornered prism of glass, it is split up into all the coloured rays of the rainbow. This is called the solar spectrum; and when light falls upon a green leaf, seven portions are stopped, a band in the red-orange, three very broad ones in the blue and violet end, and fainter ones elsewhere. So that if the leaf is thin enough to transmit any light, the green rays are the only ones visible, as also when reflected. This causes leaves to be green to the eye.

Now it is by means of these bands of light that the living protoplasm can decompose CO_2. That light can cause chemical changes is a familiar fact, for many coloured objects will fade if left in the sun, as carpets, curtains, &c.; and we are all familiar with its effects on a prepared photographic plate.

The effects produced in a green leaf are of the utmost consequence. The CO_2 is decomposed, the C is retained and with the aid of hydrogen (H) and O derived from water (H_2O), a compound is made, which again, after undergoing certain changes, affords the first *visible* result, viz., starch ($C_6H_{10}O_5$). This appears like white specks on the green chlorophyll granules. They increase in size till they acquire the form characteristic of the plant. In potatoes they are large, oval, banded and with a dark spot. In rice they are very minute; and so, for others.

A simple way to prove the existence of starch is to take some very thin delicate leaf, as from the little aquatic star-wort, which has been exposed for some time to bright sunlight, and then with a camel's hair brush sweep a little tincture of iodine over it. The leaf at once assumes a dark purple hue, as iodine has the effect of colouring the starch. If the leaf is thus tested after it has been in total darkness for some hours, then the iodine will fail to produce the result, showing that no starch is present.

Starch is solid, and as such is of no use; but at night it is

dissolved, turned into soluble sugar, and then transmitted through the plant to all parts which are growing, to be converted into cellulose, of which the cell-walls are composed.

If more starch is made than is required for growth, the sugar can be reformed into starch in seeds, tubers, &c., as reservoirs for future use. Tincture of iodine touched on a cut bean or potato will at once reveal the starch stored up in the cells.

As protoplasm must increase in quantity as the plant grows, another use of starch is as an ingredient in its manufacture; but in this the element nitrogen (N) is required. This is supplied from certain mineral substances derived from the soil.

If there be more of this manufactured "nitrogenous" substance than required at the time, it is stored up with the starch in various ways. It may be distinguished under the microscope, for iodine colours it a yellowish brown; but it is not so readily observable to the naked eye, though bran, which contains a great quantity, may reveal it.

Transpiration.—This function consists of the throwing off the vapour of water, and is also an effect of light. Experiments made by placing plants under coloured glasses show that it is mainly a result of the red and violet rays; at least *maxima* of transpiration occur with those bands of the spectrum. It is not due to heat-rays, though heat will cause *evaporation* of moisture from all wet substances, from living as well as from dead structures, if the heat be great. This, however, must be carefully distinguished from transpiration, which is a property of *living* protoplasm only.

A simple experiment will show this. Take a tumbler full of water, place a card over it, and let a few leaves have their stalks, passing through a hole, standing within the water. Now cover them with a dry tumbler. Place it in the sun-light. In a few minutes the inside of the upper inverted tumbler will be covered with moisture.

If, however, it be placed in total darkness, as in a cupboard, the temperature being the same, no moisture will be found.

The importance of this function to the plant, of getting rid of superfluous moisture, resides in the fact that all plants require certain mineral salts; but these are only dissolved in the minutest quantity in the water of the soils, say 2 per cent., so that to secure a sufficient supply of potash, lime, phosphoric acid, &c., for healthy growth, a great deal more water must be absorbed than the plant can possibly do with, and so it is exhaled or transpired.

Absorption.—Leaves are not, as a rule, water-absorbing organs; but if the loss by transpiration and evaporation be very great under brilliant sun-light and excessive heat, as in the African deserts, and, in fact, be greater than the supply by the roots, then they are quite able to take water in, either from rain or dew. In fact, in some desert plants, as the tamarix, certain salts, especially "chlorides," are secreted by the leaf, which

absorb the moisture of heavy dews, and so transmit it to the inner tissues of the leaf. In others the superficial hairs—which are always more abundant upon plants in dry places than wet ones—can also absorb it. Similarly is it with our own wild flowers: if they become flaccid or exhausted in drought, the leaves will readily absorb water sprinkled upon them.

If the student will take a few sprays of various plants, expose them for an hour or two in the afternoon, till they are beginning to fade, then spread them out on the ground all night, and examine them in the early morning, they will be found to be quite freshened up again, if there has been any dew.

GEORGE HENSLOW.

JENNY.

DID ever any body (besides me) pet a guinea fowl? Mine is a most loving little bird; shall I tell you her history?

Some time ago I had a pair of guinea fowls given me; they were very wild and shy, and would hardly let me get near enough to feed them. They would fly quite away when I went near them, over the house-top, or anywhere, so they could get out of sight of me. They must have been very old birds, for the hen laid but few eggs, and even those were hard to find, she hid her nest so cunningly. Well, after a bit, she set herself on six brown eggs, and in due time five little guinea chicks made their appearance—such pretty, tiny mites they were, so soft and fluffy, for all the world like little partridges. For several days I scarcely saw them, for when I went to feed them the old birds were most furious: they flew at me, beat me with their wings, knocked my hat off many times, and made great scratches with their sharp claws all over my unlucky arms. I never saw such furies; I was quite afraid of them, and sometimes dropped the food and ran away. But mostly I was brave enough to place it near the little ones, which always squatted in the grass directly their most pugnacious parents came at me. They did not get much good of it, poor mites, for the old birds eat it all up themselves in the most greedy manner possible as soon as they thought they had driven me away, without giving the young ones any. Poor little things, their mother woke them ever so early in the morning, and dragged them with her through the dewy grass, till one by one four of them died. Of course it was nice enough for her, hardy old bird that she was, a regular Spartan mother, but evidently that course of treatment was not good for baby guinea chicks. So, really at the risk of my life I rescued the remaining chick, and under the shelter of a big umbrella, with hat torn off, quite breathless, and with many scratches, I carried off my trembling prize, and placed her under

the charge of a kind old hen, who had just hatched off some little ducklings. Some hens would have killed the small intruder, but this was a nice, stupid fat old hen, who never noticed the difference between her yellow ducklings and little brown guinea chick.

The little thing throve wonderfully with her foster mother, was on friendly terms with the ducklings, went out walks with them, tried to swim with them, nearly got drowned in the rash attempt, and soon left off her shy way of squatting in the grass when she saw me coming. Little ducks are always tame, and when they ran to meet me Jenny came too, and from being petted more than the ducklings became much tamer than they, often perching on my shoulder, or on my wrist, and nestling in my lap when I was reading in the garden. Soon she deserted her ducks and foster mother, though always on excellent terms with them, and devoted herself wholly to me, following me all over the garden and into the house, if allowed. The cats and Jenny are fast friends, indeed I believe she fancies herself a cat, she runs about so much with them. She eats out of the same plate with them, and often picks one end of a bone while pussy is eating at the other end. The kittens have fine games with Jenny, playing with her tail and taking flying leaps right over her back, and Jenny takes it all in good part. Often when I am in my bedroom with the window open there comes a whirr of wings, and there is Jenny flying in at the window and nestling at my feet. If the window is shut and she can find a door open, she hops upstairs instead. She lives almost entirely in the flower garden, and does mischief there. At night she perches on a tree outside the servants' bedroom, just where the light falls on her when Mary goes to bed. Curiously enough that is the only bedroom window near which she can perch, and the spot where she sits is quite the nearest to the window. Mary, who is fond of her, says, "Good-night, Jenny," and Jenny never fails to give a responsive chirp. If wet or cold, I put her in the stable with the cats. One night it came on wet and stormy after dark, and in the morning she did not come down at all. So I stood on the steps and held a long-handled rake up to her, and Jenny stepped gingerly upon the rake and quietly sat on it while I descended the steps—Jenny, rake and all. Poor little bird, she was benumbed with cold, and felt, I suppose, unable to fly down. I took her to the kitchen fire, rubbed her dry and fed her. Then I left her for a time, and when I went to look at her again, there she was perched on the back of a kitchen chair before the fire.

Jenny never attempted to join her parents: there is also a flock of guinea fowl on an adjoining farm, and she can hear their cry of "Come back, come back," but she never responds to them, and never goes near them. At breakfast and dinner time she never fails to come on the window-sill outside the room where we are sitting, and gently taps the window with her beak for a piece of bread. At other times if I am sitting near the

window she will come, evidently feeling pleasure in being near me. She is most useful in the flower garden, for she eats a great quantity of insects. If an ant's nest gets disturbed, Jenny is sure to be on the spot, pecking up the ants—peck, peck, peck, goes her little beak, as fast as ever it can go. She is also a good fly catcher, and amuses herself darting about the lawn after them. When on the window sill, she imagines the flies inside the window are outside, and there is such a tapping on the glass trying to catch them, for Jenny cannot understand the glass being between. I caught a bee unhurt one day, and put it carefully outside the window; unluckily for my bee, Jenny was on the watch, and caught and swallowed it in a moment.

Jenny is three years old now. She laid 108 eggs during her first summer—a great quantity, I thought, for one small bird. Her first egg was laid on the front door-mat, very convenient and quite to one's hand, but rather liable to be trodden upon. So I made her a nice little nest in the stable, put her egg there, and next day showed her the nest. She took to it at once, and never laid anywhere else all that summer. One day in the following spring I heard a fluttering noise in the kitchen, and upon investigation I found Jenny calmly sitting on the top shelf of the kitchen dresser, over an empty salt cellar, which she had coolly appropriated for her nest. "Jenny does not mean to lay many eggs this year," thought I, considering the salt cellar held but one. Well, I wanted the salt cellar for my own use, and although the kitchen dresser was quite as convenient as the front door-mat, and even more to one's hand, yet there were certain objections to it, so I made up her nest in the stable again, and Jenny was quite contented, and laid eighty-seven eggs straight off without stopping—one every day. She always says "chick" in a highly triumphant manner directly she has laid an egg. One day when I was busy gardening, she came to me in the greatest distress. "Tweet! tweet!" said Jenny, and ran towards the stables; I took no notice, for I was busy. "Tweet! tweet!" repeated Jenny, and off she ran again. I was intent on tying up carnations, and never thought of what she wanted. "Tweet! tweet! tweet! *tweet!*" poor Jenny cried, and pecked my dress, and looked so miserable. "What is it, Jenny?" said I. "Chick!" replied Jenny, running off again, and at last I followed her. There she stood at the stable door, which had somehow got shut. I opened it; that was what she wanted me to do, for with a grateful little chirp she flew upon her nest, as satisfied as could be. She knows her name quite well: "Jenny," called softly at the door, will bring her from the other end of the garden.

That is all I have to tell about my pet, except that even as I write she finds her way into my room, and nestling at my feet looks lovingly up at me, with her dear little bright brown eyes.

Bessie Hobart.

THE VANISHING AFRICAN FAUNA.

(Reprinted, by kind permission, from *The Standard*.)

THE rapid diminution in the numbers of many kinds of big game in Africa, and the extinction, within living memory, of some others, are matter of common knowledge to sportsmen and naturalists. That wild animals are always driven back before advancing civilisation is a truism. The slaughter of the African fauna, however, has been so great and so purposeless, that could the story of the last hundred years be told in all its fulness it would appear incredible. Naturally, the elephant claims first place. It is still fairly abundant in Central Africa, but in South Africa, where it formerly swarmed, it is rapidly approaching extinction. Oswell, the friend of Livingstone, who first visited Africa on a hunting expedition in 1844, has told the story, all too briefly, of his experiences, and expressed the opinion that to our great-great-grandchildren the African elephant will be as the mammoth is to us. Kirby clothes the same opinion in almost identical language, and after urging that the past, which cannot be recalled, should induce sportsmen to shoot fairly, and be satisfied with enough, is justly severe on those who "deliberately bowl over ewes and cows" with the one idea of topping the record. The traffic in ivory means the extinction of the elephant; but to kill an elephant for its tusks seems the worst possible use to which one can put such a mighty beast. Sir Samuel Baker pleaded for protection, and still more strongly that some attempt should be made to domesticate the African elephant, condemning the apathy even of European settlers, who have hitherto ignored the capabilities of this useful creature. When the late Sultan of Zanzibar visited our Zoological Gardens, and saw Jumbo carrying loads of delighted children, he asked why these animals were not utilised in his own country. The late Mr. Bartlett was always interested in the subject, and advocated, as does Mr. Sclater, the Secretary of the Zoological Society, the bringing over of trained Indian elephants, and natives used to *keddah* work, to East Africa. Gordon, too, hoped to employ the elephant in transport in Africa, and, shortly before the fall of Khartoum, wrote to Mr. Sclater on the subject. In Cape Colony the elephant has been protected since 1830, a permit being necessary to kill a single specimen: there is also a measure of protection in the East African Protectorate, and in German East Africa, where a permit for two elephants and two rhinoceroses costs £25. The hippopotamus appears to be extinct in Natal, where the last specimen, a fine old bull, now in the Durban Museum, was killed about twelve months ago, the Government having consented to the extermination of the small herd living in Sea

Cow Lake, a small lagoon near Durban, on account of the damage they did in the sugar-cane plantations. The few that still remain in Zululand are all that are left in British South Africa. Rhinoceroses, too, are becoming scarce, and the white, or square-mouthed, form is practically extinct. In 1886 fifteen were killed, and in the following year Selous saw the tracks of two or three. Writing in 1893, that famous hunter said that, twenty years before, it was a common animal over an enormous extent of country in Central South Africa. In the same year Mr. Coryndon obtained two specimens, one of which went to the British Museum (Natural History) and the other to Mr. Walter Rothschild's Museum at Tring.

There is a sad tale to tell about the antelopes. Cornwallis Harris hunted in South Africa late in the "thirties," and, describing the game on a tract near the Vaal River, in the Orange Free State, he says:—"The number of wild animals on this swampy flat almost realised fable, the roads made by their incessant tramp resembling so many well-travelled highways. At every step incredible herds of bontebucks, blesbucks, and springbucks, with troops of gnus and squadrons of the common or stripeless quagga, were performing their complicated evolutions; and not infrequently a knot of ostriches, decked in their white plumes, played the part of General Officer and Staff with such strict propriety as further to remind the spectator of a cavalry review." The blesbuck is now so scarce that it can be hardly reckoned a beast of chase; and Mr. Bryden says that the scant remnants of the once innumerable herds are living on a few farms in the Orange Free State and the Transvaal, under the care of Boer farmers. The experiment is an extremely interesting one—and others of the same kind are being carried on. Mr. Bryden points out that within the next few years we shall know whether this antelope is to be rescued from utter extinction or is doomed to vanish miserably from the face of the earth. The bontebuck is, perhaps, worse off as regards numbers; for there remains but a single herd, living, strictly preserved, in the south of Cape Colony. The numbers of the springbuck have, indeed, diminished, but it may still be said to be fairly abundant in South Africa, thanks to the protection afforded it in Cape Colony, the Orange Free State, and the Transvaal. White-tailed gnus are rapidly reaching vanishing point, though one writer on popular natural history recently declared in print that "they wander about in herds of from eight or ten to forty," and that "hunters find out their lairs and shoot them in order to eat their flesh, which is dried and made into what the Boers call biltong." Nevertheless, it is safer to accept the account given of this antelope by Mr. Bryden that it is probably extinct in a wild condition, but preserved in the Orange Free State, where some six or seven hundred head are living on the lands of Dutch farmers. The true hartebeest is practically exterminated in the Orange Free State and in the

Transvaal, though it is abundant in Bechuanaland; and it is from this fine antelope that the Chief Khama takes his name. The eland, the largest and finest of the antelopes, lives on, but in greatly diminished numbers. When Lord Derby imported his herd into England, in 1840, great things were hoped, in the way of providing a new meat, from the acclimatisation of this animal. The hopes have been disappointed, but it certainly ought to be possible to domesticate this animal in Africa. The giraffe is rapidly approaching extermination south of the Zambesi.

The quagga, the most horse-like of the striped asses, is "as absolutely extinct as the dodo." The last specimen exhibited alive in England was presented to the Zoological Gardens in 1858. Just a century ago Barrow, in his "Travels," gave a glowing description of its good qualities, which should have ensured its preservation. He wrote of it as well shaped and strong limbed, not in the least vicious, but, on the contrary, soon rendered by domestication mild and tractable. He goes on to speak of the abundance of quaggas, yet few, he says, have given themselves the trouble of turning them to any kind of use. This is the more to be regretted since the quagga was fully as strong as, and infinitely more beautiful than, the mule, as easily supported on almost any kind of food, and never out of flesh. In the early part of this century a pair of imported quaggas were driven about London by Mr. Sheriff Parkins; and hybrids bred in the Zoological Gardens between the quagga and the ass used to draw a light tandem, in which vegetables were brought from Covent Garden to the menagerie at Regent's Park. The mountain zebra is rapidly approaching extinction: like the white-tailed gnu, it scarcely exists as a wild species. The few that are left live under partial protection, in the wilder mountain ranges of Cape Colony. It does not seem well adapted for domestication; nevertheless, it has been broken to saddle, and Mrs. Hayes rode one that had been for some time in a travelling menagerie in India. Burchell's zebra—the species usually seen in menageries—is still pretty plentiful; and it would be well if something could be done in the way of domesticating it, for this would, to some extent, solve the difficult question of transport through the fly country. Birds have not suffered to anything like the same extent as beasts. The ostrich has been domesticated, and the secretary bird is said to be protected in Cape Colony, though some sportsmen doubt whether it deserves protection, declaring it to be an enemy to the young of all feathered game, and to the young of the smaller antelopes and hares. It will be seen that in the case of many of the threatened species measures for their protection have already been taken. Mr. Rhodes, too, has done something in the way of setting apart a reserve, and the East Africa Protectorate has declared the Kenia district a sanctuary for big game, which ivory hunters and sportsmen generally are

prohibited from entering for shooting purposes. There is also a proposal to establish a reserve in Rhodesia, to be conducted on commercial principles. So that something has been done to stay the work of extermination.

THE EXTERMINATION OF MONKEYS.

HILST a great deal has been written and said with a view to checking the destruction of bird life, scarcely a voice has been lifted on behalf of many forms of animal life which are silently, yet rapidly, being wiped out of existence.

Some time back my attention was arrested by two small paragraphs in *The Echo* drawing attention to the slaughter of monkeys upon the Gold Coast, and with a view to ascertaining further facts I made a careful examination of the Reports to the Colonial Secretary, issued annually by Mr. F. M. Hodgson, Acting Governor of the Gold Coast.

Mr. Hodgson refers in detail in his Reports to each article of export, and the remarks which he makes in reference to the export of monkey skins are clearly sympathetic in their bearings, so that I feel I cannot do better than give the extracts in his own words.

In 1892 he writes as follows:—"One of the most remarkable exports is that of monkey skins. During the last five years an average of 175,000 monkey skins, valued at about £30,000, have been exported annually; only skins in good condition and with few shot-holes are taken, and under the circumstances it may safely be asserted that at least 200,000 monkeys are massacred every year on the Gold Coast. The skins most sought after are those of the *Colobus vallerosus*, which are often as large as a big dog and have beautiful coats of long black silky hair."

Again writing in 1894 Mr. Hodgson says: "The slaughter of monkeys continues, no fewer than 168,405 skins, of the total value of £41,001 14s. 10d., having been exported from the Gold Coast during the year."

In 1896 Mr. Hodgson again reports as follows:—"Monkey skins are scarcer than formerly, the increasing warfare carried on against the unfortunate animals which supply this article of commerce having resulted in the extermination of the species in the less distant provinces. In 1894, 168,405 skins valued at £41,001 were exported, whereas in 1896 the number fell to 67,600, valued at £8,662."

And now they are giving out. In six years no less than 884,768 monkey skins have been exported to the value of £195,300, and to obtain these skins, which must be in good condition, he estimates that not less than one million of monkeys have been massacred! Yet nothing has been done, no close

time has been afforded them, and the work of blotting out these beautiful innocent creatures is steadily proceeding. Where are our leading naturalists? The men whose words would carry weight—can they do nothing? Why not prohibit the destruction for a time, before it is too late?

Clearly at the present rate the total extinction of that "article of commerce" is imminent, so that upon the lower ground of commerce alone a close time should be established. There are, however, other reasons why the extinction should be stopped. In February, 1893, many parts of the Colony were visited by large swarms of locusts, and at Accra they took about three hours passing over the town, whilst in the Kwitta district much damage was done to the crops. Monkeys are great destroyers of insects, and for this reason their presence may be of great service, and their extermination may prove a calamity. Anyone who has watched a mother monkey tending her young one, and has noted the tender care and devoted attention which she pays to it, cannot but be touched with the intensely human side of their character. I am absolutely convinced that they possess a very high order of intellect, and are capable of reasoning, for I could quote instances which have come under my own observation which clearly prove this to be the case, in individuals at least. They are intensely sensitive and affectionate, and their devotion to their mates is such that if separated they will often pine away and die. The memory of one little companion which would sit by me and look up into my face, or seated on my shoulder would twine its long soft tail round my neck, leads me to write this, in the hope that it may meet the eye of someone whose hand will be more powerful than mine to check this heartless butchery—for the Gold Coast is rich in some of the most beautiful forms of monkeys, which will doubtless all sooner or later fall a prey to the trade gunners.

ROBERT MORLEY.

REVIEWS AND EXCHANGES.

Biographical Index of British and Irish Botanists. By James Britten, K.S.G., F.L.S., and G. S. Boulger, F.L.S., F.G.S. *First Supplement* (1893-97). London: West, Newman, & Co., 1899. Price 1s. 6d. net.

This index of botanists dead and gone is one of the most useful compilations for a working naturalist. The wrong people so often make themselves responsible for work of this sort that it is a matter for congratulation that not only the right man but the right two men have found this task to their hand. An index or a catalogue is in the first degree a thing to be found fault with; all the fighting and carping instincts in the mere human being are roused at the mere sight of an index. The average man lays aside promptly the most absorbing work and neglects appointments merely to test an index, and he discovers the first error with unholy joy. The present writer has spent some hours in this sportsmanlike pursuit without result so far, but he has not by any means given up hope. It is biographical pemmican that has to be digested, *e.g.* :—

"White, Rev. Gilbert (1720-93); b. Selborne, Hants, 18 July, 1720; d. Selborne, 26 June, 1793; bur. Selborne Churchyard. M.A.Oxon., 1746. Marked Selborne pl. in a copy of Hudson's Fl. Angl. 'Natural History of Selborne,' 1789. 'Naturalist's Calendar,' 1795. Jacks. 213. Journ. Bot., 1893, 289: Alumn. Oxon."

It is plain that there is no room for sentiment here. "The lives of great men all remind us" when written in this capital style that half the scandals of history would have been buried had the method been invented sooner. To be serious and to the point, it would be impossible in any notice to give an adequate idea of the immense labour and research expended by the authors on this useful and admirable work. The original index and this present supplement should be in the library of every working botanist. GEORGE MURRAY.

Highways, Byways, and Waterways of East Anglia. By William A. Dutt. Lowestoft: Dotesio and Todd; London: Simpkin, Marshall and Co. Price 1s. net.

This is a pleasantly written collection of "prose pastorals," in part reprinted from the *Globe* and the *Pall Mall Gazette*, by a resident of Lowestoft—several articles from whose pen have already appeared in our pages. We have little doubt that the quiet contemplative tone of these papers will commend them to the taste of our readers.

Received.—*Knowledge, Science Gossip, Our Animal Friends, The Animals' Friend, Humanity, The Naturalist, The Irish Naturalist, and Agricultural Economist* for May; *The Victorian Naturalist* for March, 1899.

NATURAL HISTORY NOTES AND QUERIES.

A Study in Black and White.—A friend has just shown me a curiosity in the shape of a mouse's nest made entirely of *bristles*, taken partly from a blacking brush and partly from a white scrubbing-brush, and so arranged as to form quite a pattern in black and white. The bristles are so cleverly interwoven that the nest can be taken up in the hand without falling to pieces, though at first sight it looks as if it could not hold together. A small heap of wool nibbled from the carpet lay close by, apparently for the purpose of lining the nest, but further operations were disturbed by the finder, who discovered it on the top of the meat-safe, the mice evidently thinking that they would make sure of their larder to start with, and make use of the first materials at hand for nest building.

April 30, 1899. A. F. CURTIS.

Cannibal Dormice.—Having read with great interest Mr. Dighton's account of his dormice, may I be permitted to relate an occurrence which came under my observation some twelve years ago? Two full-grown dormice had during several months inhabited in perfect harmony a spacious, closely-wired cage, one end of which was partitioned off by wood to form a sleeping box. One night in July, soon after 10 o'clock, I looked at them as usual before going to bed and found them all right, feeding contentedly. About 3 a.m. I woke to hear the sound of squeaking and scuffling issuing from the cage, the wires of which on investigation were found smeared with blood. The combatants had retired to the sleeping-box. I opened it, removed the whole of the contents, and then saw that one of the mice lacked quite half its tail, the stump of which was bleeding; not after the most careful and thorough examination of cage and bedding was the missing portion anywhere to be found. To make quite sure on this point, I pulled the hay bedding asunder, shred by shred, then, and again some hours later, but found not the slightest fragment of the missing member. Had only the outer covering of skin and fur been absent from the tail I should not have been so much surprised, as it comes off very easily if pulled; but the bone was gone too, and had evidently been bitten right through. As the uninjured mouse looked extremely and unwontedly fat next day, I suspected it of having devoured its

companion's tail. No other mouse could possibly have entered the cage, as the wires were far too close together. The wounded mouse ultimately recovered, but never again shared its former friend's home.

C. M. DUPPA.

Blackbird Nesting Twice in Same Nest.—It may perhaps interest some of your readers to have a short history of a pair of blackbirds and their nesting arrangements this spring. In my garden, in Edinburgh, a nest was built in March in a low and very bushy fir-tree, a singularly snug place. The birds sat through various slight snowstorms and intense frost, one or other of them seldom leaving the nest for an instant. They had only two eggs, and succeeded in hatching both, and two fine little birds were duly fledged and taken away, we think, into a neighbouring garden close by, as we have never seen them since the day they left the nest. The old birds seemed very busy and quite happy, never being long absent from the lawn on which the fir-tree grows, but evidently feeding the young ones somewhere. At the end of a week I observed the hen bird sitting in the old nest. She has again laid two eggs, and is now sitting as closely as before. Her mate spends most of his time sitting in a tree near by, singing to her, but flies away at intervals, as we suppose, to feed the young ones. He always flies in the same direction, and occasionally, with much chattering and flying about, persuades the hen to go with him for a very few minutes. Is it not very unusual for birds, excepting, of course, swallows, starlings, and sparrows, to use the same nest twice?

C. J. W.

Cuckoo.—From a reliable source, I hear of a cuckoo's egg laid on April 21. No doubt this is very early.

Market Weston, Thetford. EDMUND THOMAS DAUBENY.

A Cuckoo "Myth."—I have a perfect recollection of seeing the young cuckoo throw the young hedge-sparrows out of the nest at Hayes, getting its back, which is very broad and flat, under the young bird and backing it up over the side. I cannot understand how people can go on arguing the question for generations. There is not much difficulty in getting a cuckoo's egg, or a nest to have it hatched in. I took four cuckoos' eggs in one day at Tritton decoy from reed birds' nests. I remember hatching one in a greenfinches' nest at Hayes: it took full possession though I did not see the process, but died in a few days, as the old birds fed it on seeds.

Waverley, New Zealand, March 3, 1899. OWEN HAWES.

Sister as Foster-Mother.—I saw a strange thing at one of the hotels in Waverley, yesterday. A hen which had a brood of chickens a few months back had hatched off another lot and died, or was killed when they were a few days old, when a pullet of her previous brood, about three-parts grown, took charge, and is a capital mother, clucking, &c., like an old hen. I never heard of such a thing before and should think it is almost unique.

Waverley, New Zealand, March 26, 1899. OWEN HAWES.

Co-operation among Swallows.—We are situated on a hill side, quite away from any other house, and are annually resorted to by several swallows who build their nests under the eaves of our house. Last spring (1898) we had about ten nests round the house: one pair of birds chose a quiet corner to build in, just over our bedroom windows, the which are casements opening outwards, and consequently we objected to the mess they made and removed the first patches of mud affixed to the cement wall: the birds repeated the operation, and we as regularly knocked it off. This performance continued for some days. At length the birds appeared to have determined to have their own way. We went away from home for the day, and on our return found they had succeeded in fixing up nearly half a nest: we therefore watched the proceeding.

We have a small pond, about thirty or forty feet from the house, and we found all the bird friends who had built around had evidently been called in to help in the emergency, for there were now some fourteen or fifteen, or more, going backwards and forwards from the pond to the disputed corner, always bringing their mouths full of mud from the pond and depositing it on the house until in a very short time the nest was complete, and the meeting separated

leaving a pair of birds, evidently the original owners, in possession of the home. We of course rewarded their pertinacity by leaving them there. This was in April last year, but up to the present time no swallows have this year returned, although they have generally turned up during April.

The Beacon, Morant's Court Hill, Sevenoaks. GEORGE CHRISTIE.

Summer Migrants.—I heard the nightingale for the first time this year on April 28, in a northern suburb. Is this not somewhat early? Is there any truth in the saying that the swallows come with the celandine? I saw the first swallow this evening, but only one, at a spot where I have always seen several before. The celandine I have been picking for the last fortnight or more.

Stoke Newington, N., May 2, 1899. J. G. BRADFORD.

The dates given in "The Naturalists' Diary" are: Nightingale, April 24; swallow, March 23; *Chelidonium*, April 3—May 24, averaging May 1.—*Ed. N.N.*

Dates of Arrivals of Summer Migrants at Astwood Bank, Redditch:—

	1899.	1898.
Chiff-chaff	April 6	April 11
Willow-wren	,, 13	,, 9
Titlark	,, 18	,, 15
Redstart	,, 19	,, 16
Nightingale	,, 20	,, 16
House-martin	,, 20	,, 15
Swallow	,, 24	,, 15
Sandmartin	,, 25	May 26
Cuckoo	,, 25	April 16
Blackcap	,, 28	,, 23
Whitethroat	,, 28	,, 14
Lesser whitethroat	,, 30	,, 21
Whin chat	,, 30	,, 24
Yellow wagtail,	May 1	,, 24
Wood wren	,, 3	May 8
Sedgewarbler	,, 7	,, 8
Swift	,, 7	,, 8
Garden warbler	,, 9	April 28
Corncrake	not arrived	,, 28
Flycatcher	,, ,,	May 3

It will thus be seen that most of our little friends from some unknown cause have been a few days later than usual in making their appearance here, although some were reported in other districts some weeks before. As to the reports of cuckoos being heard on some "warm" day (as the reports usually read) in January or February, I take no notice of them, because the note is so easily imitated by boys or others that I look upon it as a stupid hoax to set someone writing to the press.

Fieldfares still linger in flocks. I saw two flights on Sunday last (7th) apparently reluctant to leave during such cold frosty weather as we have recently passed through, which I find has done immense damage to fruit crops. I find on referring to fieldfares in Gilbert White's letter of December 20, 1770, the following:—"Fieldfares and redwings disappear sooner or later, according as the warm weather comes on earlier or later, for I well remember, after that dreadful winter, 1739-40, that cold north-east winds continued to blow [such as we have lately experienced,—J. H.] on through April and May, and that these kinds of birds, what few remained of them, did not depart as usual, but were seen lingering about till the beginning of June."

I am in hopes that readers will take the *season at hand now* to prove the accuracy of young cuckoos getting both young birds *and eggs* on their backs and ejecting them. There is *no difficulty in proving it*, if they will leave a cuckoo's egg to hatch out and then follow it up and watch them.

JAMES HIAM.

Robins' Nests.—Two pairs of robins selected very singular nesting places this season in Maynooth College. Near the gate of the vegetable garden and

about four yards from the car-way leading thereto, an old tin vessel, 18 inches by 6 inches, with one end open, lay on its side in the grass. In this vessel a pair of robins built their nest, and though the roadway is much frequented, they successfully reared a brood of two.

The site chosen by the other pair was still more singular. This was at the top of the reredos of St. Joseph's altar in one of the chapels—in a small cavity between the reredos and the wall. This chapel is used as an oratory by the students of St. Joseph's division, numbering about 200, who visit it almost every hour in the day, and two masses are celebrated at the altar in question every day in the week. I think it showed very great trustfulness on the part of the robins to set about making a nest in such a place and under such conditions. But they not only made the nest, but brought out three young ones and took them away, full-fledged, on one of the last days of April.

St. Patrick's College, Maynooth, May 6, 1899. J. G.

A Humane Drake.—Yesterday one of our little chicks fell into the ducks' tub of water, before my little girl who was standing near could reach it. The drake rushed to the rescue, seized the little thing by its wing and flung it safe and sound to land. I must also record the strange conduct of a sparrow. A friend of mine saw three or four starlings' eggs on her lawn. On going later to remove them she saw a sparrow busy eating the contents, having neatly pecked off the end of the shell.

The Firs, Northwood, May 9. C. SCHULTZ.

Albinism in Birds.—I have collected some cases of partial or total albinism in birds which seem to show that this abnormality is quite common in this part of the country. These are (1) blackbird, nearly all white, seen to enter fir wood near Wythenshawe Hall, Cheshire, in 1898; (2) blackbird with white collar right round neck, about a mile from the place where the other was seen, also in 1898; (3) blackbird with white upper tail-coverts, seen by myself in Baguley, Cheshire, in April of this year; (4) white sparrow, flying repeatedly with flock of normal birds, at Baguley Hall; (5) a few years ago a white swallow was seen all one summer in a field about a mile from here.

Sale, Manchester. GRAHAM RENSHAW.

Albinism in the House-sparrow.—I was recently shown a white house-sparrow by some friends. The bird frequents their garden and is sometimes accompanied by a pied relative. The one I saw appeared, from the view I had of it, to be entirely white, except at the tips of the wings and tail, which were of the ordinary colour. It has been seen in the same spot for several seasons, and is on amicable terms with the other members of the same species. Is albinism common in the house-sparrow?

Sydenham, May 15, 1899. W. F. GARDENER.

Pied Rooks.—In reference to the frequency with which pied rooks occur, I have not in my experience found them to be rare birds. I saw one only a few months ago in a field at Stretford, in Lancashire, and also another at Plumbley, Cheshire, on April 4, 1896. A third specimen, the wings of which I have in my possession, had some of the primary quills and upper wing-coverts partly white and others wholly so, thus agreeing with the distribution of white feathers in the rook seen by your correspondent "H."

Sale Bridge House, Sale, Manchester. GRAHAM RENSHAW.

Dropped Starlings' Eggs.—Can any reader explain why a certain number of starlings' eggs are always to be found on the ground during the nesting season? For many years I have always picked up one or two either whole or broken, and yesterday found one quite sound in the middle of a freshly-mown lawn, and about ten yards from a nesting-box in a beech tree, now occupied by a couple of starlings.

May 3, 1897. W.

Tits *versus* Nuthatches.—Ten days ago I inspected a number of boxes placed in trees by a friend for birds to nest in. Every box save one was occupied—

three of them by nuthatches, which had plastered the sides of the holes with mud. I have just received a letter to say that tits have ousted the nuthatches from two of the boxes—a great tit being the tyrant in one case and a blue tit in the other. Tits evidently live by their wits, and in these two instances have certainly outwitted a much more powerful bird.

Market Weston, Thetford, May 6, 1899. EDMUND THOS. DAUBENY.

Toad Casting its Skin.—I see in your April number that M. S. Y. asks it is a fact that toads shed and eat their skins. I beg to tell what I observed myself early in June last year. I saw a large toad sitting on a flower bed, moving about in a most excited manner. I could not think what he was doing; so going close, I saw him in the act of casting his skin—he had evidently finished skinning his back, as it appeared shining and new looking. He scraped the skin off one of his fore legs with the other and his mouth, and then rolling it up in a long roll he swallowed it, and then did the same to the other leg. He sat there evidently wishing me to admire his new suit.

Hinxworth Rectory, Baldock. M. PINFOLD.

Abnormal Blue-bells.—Last year I found in a strip of wood in the parish of Teston, a blue-bell with the flowers far apart, some of the little stalks of the flower being an inch long. I have now found a specimen (close to the same spot) with prolonged bracts, which I enclose.

ARTHUR H. COURTHOPE.

Claremont, Wateringbury, Kent. April 24, 1899.

SELBORNE SOCIETY NOTICES.

Council and Committee Meetings.—The next meetings of the Council will be held on Tuesdays, June 6, June 20, and July 4, at 5.30.

FIELD CLUB RAMBLES.

June 10.—Take 2.13 train from Fenchurch Street to North Weald (or 2.8 from Liverpool Street, in which case change at Snaresbrook). Walk through Ongar Park Wood to Theydon. Tea at "Foresters' Arms," Baldwin's Hill, at 6. Return through Epping Forest to Chingford. Guide, Mr. C. Nicholson.

June 17.—Merstham to Caterham *viâ* Chaldon (curious old frescoes in church). Trains leave Charing Cross 2.5, Cannon Street 2.17, London Bridge (S.E.R.) 2.15, East Croydon 2.39. Take return tickets to Purley and pay excess on arrival at Merstham. Guide, Mr. A. B. Wilkinson.

June 24.—No ramble arranged.

July 1.—Meet at Weybridge Station. Train leaves Waterloo (main line) 2.29; Surbiton, 2.52. Does not stop at Clapham Junction. Dr. L. Beale, F.R.S., has kindly consented to conduct the party through his gardens at Caneswood, Weybridge Heath. Thence through woods and by riverside path to New Haw Lock, where tea will be provided about 6 o'clock at the White Hart or cottage adjoining. Return by banks of Wey to Addlestone or Weybridge. Guide, Dr. Willson.

NEWS FROM THE BRANCHES.

Bath.—The first excursion of the season took place on Saturday, April 8, conducted by Mr. Bartelt, to the beautiful old manor of Queen Charlton. Here a kind reception awaited the members, Mrs. Haines having invited them to tea, which they took in a fine old panelled dining-room. Tradition says that four queens have visited the house—Catherine Parr, Elizabeth, Anne of Denmark, and Charlotte, wife of George III. The bed-room in which they slept is shown, and the head and foot of the old carved bedstead adorns the entrance hall.

After tea a visit was paid to the convent garden and nuns' walk. The only flowers to be had were the wall pennywort, and a quantity of blue and white violets.

Saturday, May 6.—The weather was perfect for the second ramble of this Branch. The excursion was taken to Tiverton Wood by kind permission of Mr. Carr, under the direction of the Rev. Stokes Shaw. Some pretty peeps of the Avon were shown *en route*, and a delightful ramble taken through the wood. Bluebells were plentiful, but no rare plants. One curious thing was noticed—the branch of a tree had grown out of one part and in at another, forming quite a handle, like the handle of a jug. Tea was taken in the pretty vicarage garden by the kind invitation of the vicar, and after seeing the fine old church with a perfect Norman arch, and other antiquities, the party wended its way homewards.

Croydon and Norwood.—A special committee of the Society has been formed to watch buildings and other objects of antiquarian interest in Croydon, with a view to their preservation. At present the attention of the committee is being devoted to the Whitgift Foundation Hospital, which, with the ancient Archbishop's Palace, claim most of the attention of local antiquarians. The committee met on May 8 for the first time, Mr. W. Whitaker, F.R.S., President of the Geological Society, in the chair. Dr. Hobson, County Councillor, is Hon. Sec. *pro. tem.*, and among those present were Mrs. E. Phillips, Miss Mossewhite, Messrs. Watson Slack, Councillor Evan Carpenter, E. A. Martin, F.G.S., J. C. Peters, and Alfred Jones, Warden of the Hospital. Owing to the congestion of the traffic at North End it is considered that the Hospital, which is of Elizabethan age, may be threatened with demolition, and the efforts of the Committee are being directed to the necessity of providing alternative routes of traffic.

ANSWERS TO CORRESPONDENTS.

Mrs. Needham.—The shrub is *Forsythia viridissima*, a member of the Order *Oleaceæ*, and a native of North China and Japan.

Miss Prentice.—*Helix aspersa*, which is the commonest large garden snail, lays globular eggs about 4 to 4·5 mm. in diameter. They have a shiny, elastic envelope, without any lime in it, white or slightly yellowish in colour. They are deposited in clusters of fifty to eighty, and, according to some authorities, even more. They dry and shrink on exposure to the air. Hatch in fifteen to thirty days. *Helix nemoralis* and *hortensis*, the yellow-banded snails, have small eggs about 2 or 2.5 mm. in diameter, and covered with a distinct calcareous shell. These are deposited to the number of forty to eighty. Hatch in fifteen to twenty days. The Roman snail (*Helix pomatia*) also lays eggs with a regular shell, about 6 mm. in diameter, and in clusters of sixty to ninety. Hatch in twenty to thirty days.

B. B. Woodward.

NOTICES TO CORRESPONDENTS.

1. All communications for Nature Notes must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for Nature Notes, books for review, specimens for naming, &c., should be addressed to the Editor, Professor Boulger, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. Western, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 115. JULY, 1899. Vol. X.

REPORT OF THE FIELD CLUB FOR 1898.

In presenting this Report on the work of the Field Club during the past year, the Committee would remind members that excursions were arranged for alternate Saturdays only, instead of weekly as heretofore, with satisfactory results.

Fourteen rambles were arranged, and fortunately, the weather was such that not one had to be postponed. The average number taking part in these walks was fourteen, though on several occasions this figure was almost doubled. Somewhat significantly, the first and last rambles of the season were the best attended.

The gentlemen (nine in number) who gave up their time and made all arrangements for the conduct of these parties are entitled to the grateful thanks, not only of those members who availed themselves of the opportunity, which such rambles afford, for the study of nature, but of the Society as a whole.

The first ramble of the season was to Northolt, and although this is not a new walk—in fact, the same route was traversed about the same time in 1897—yet no excursion attracted a larger number of members. As this was described in the last Report it is not necessary to dwell upon it, except to say that on its return through Perivale Wood the party was entertained with a perfect chorus of nightingales. A walk of a very different character was that of May 21st, from Woodside Park, by field paths across Dollis Brook to Totteridge Green, and thence leaving the road by field path again to Mill Hill. The scenery here, though not striking, is very pretty and the walk was much enjoyed. A most lovely route was that taken by the Club on June 4, from Caterham Valley, across the bracken-covered Coulsdon Common to Farthing Down, where some old tumuli were inspected and explained. The ramble from Theydon Bois to Copt Hall Green, on June 18th, was a revelation to those who shared the very prevalent idea that Epping Forest is a more or less wooded tract of land overrun with Bank Holiday crowds and East End bird-catchers. The route taken on this occasion led through a densely-wooded portion of the forest to Ambresbury Banks, where the ancient earthworks were viewed. Here also were seen what perhaps very few people would ever have expected to find within such a short distance of London—the forest deer not enclosed in any

park, but free to roam unmolested. The route taken on July 9, through Hayes and Keston Commons, in most lovely weather, was full of interest to all naturalists, but perhaps the botanists enjoyed themselves most. Keston Common was in its full glory of bracken, interspersed with fine clusters of heaths, the common ling or heather scarcely yet showing its blossoms. On this occasion the party also visited Cæsar's Camp and the picturesque lakes in the neighbourhood, pushing on as far as the famous "Wilberforce Seat," where the great question of slave emancipation is said to have been discussed and decided upon by Pitt and Wilberforce. A ramble from Pinner, through Eastcote to Ruislip, gave an afternoon's real enjoyment to a large party on July 16th. It is the varied and picturesque scenery that gives such a charm to the walks in this neighbourhood, and if few tangible spoils were the result of the excursion, the visitors brought away with them what are more durable, and yet do not mar the pleasure of subsequent ramblers—lasting memories of the beauties of living nature. The guide who arranged the interesting walk on August 6 is to be congratulated on discovering new routes through a well-known district. Loughton Station was the starting-point, and various footpaths were utilised in the ramble through Chigwell to Chigwell Lane. At the former place the party went over the church, and especially noted the fine brass erected to Bishop Harsnet. Lovers of Dickens were also much interested in a visit to the "King's Head Inn," the old "Maypole" of "Barnaby Rudge." It is much to be regretted that the holiday season was the cause of a small attendance.

The neighbourhood of Croydon furnishes many pleasant walks, and that undertaken on August 13 was no exception. The route taken ran from East Croydon through fields to Coombe Lane, and thence mounting the hill, and skirting Ballard's plantation, led through Addington Woods. The tomb raised by Ruskin to his father in Shirley Churchyard was visited during this ramble. August 24 was the occasion of a special whole-day excursion to that favourite piece of woodland scenery—Burnham Beeches, which has a peculiar charm in the fanciful and grotesque shapes taken by the old trees pollarded long ago, some say by Cromwell's soldiery.

The next visit to the country took place on September 3, and was as interesting as it was unique in the annals of the Club. The party started from Swanley Junction, and after a walk through strawberry plantations and hop-fields, arrived at the bee farm of the well-known agriculturist—Mr. Henry N. Brice, who had kindly undertaken to give them an insight into the wonderful branch of natural history to which he devotes so much of his time. Mr. Brice adopts the most modern method of keeping bees for pleasure and profit, and the skill with which he handled the bees without allowing anyone to become too closely acquainted with their fiery disposition was much admired. Hives were opened and contents inspected, and the method of gathering honey and raising brood was most clearly and fully explained. Particularly interesting was the method of artificial queen rearing, which was described in detail, and of which our guide was the originator. The extraction of honey from the comb, its ripening and packing for sending to market were also fully demonstrated.

The ramble on September 17 to Winchmore Hill is one which has already been undertaken at least once, and although a very favourite one, especially at this season of this year, calls for no special comment; while a full account of that on the 27th has been given by Mr. E. A. Martin in the November number of the magazine.

The well-attended visit to the "Great House" at Cheshunt on Oct. 1,

at which a very instructive and interesting paper was read by Mr. W. B. Gerish, concluded what must be acknowledged as one of the most successful years of the Club's existence.

The Committee will be glad to hear from members of the Society living in or near London who may be willing to send in their names to conduct rambles during the coming season, and to welcome to the rambles any members, with their friends, who may not hitherto have attended them.

(Signed) ERNEST A. NASH,
Hon. Sec. Field Club.

LIST OF OFFICERS FOR 1899.

Elected May 31, 1899.

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THE RIGHT HON. SIR JOHN LUBBOCK, Bart., M.P., D.C.L., F.R.S., &c.

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(With Representatives elected by the Branches.)

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Hon. Editor of "Nature Notes," the Society's Magazine.—Professor G. S. Boulger, F.L.S., F.G.S.

Hon. Librarian.—Mrs. Percy Myles.

Hon. Treasurer of the Society.—Mr. J. L. Otter.

Secretary and Offices of the Society.—Mr. A. J. Western, 20, Hanover Square, W.

Dr. FINANCIAL STATEMENT FOR THE YEAR ENDED DEC. 31, 1898. Cr.

General Fund.

Receipts.

	£	s.	d.
To Subscriptions	127	16	11
,, ,, paid over by Branches	12	13	1
,, Donations	52	3	0
,, Sale of "Nature Notes"	83	13	11
,, Percentage on Receipts of Branches	12	5	3
,, Sale of Badges	2	8	9
,, Balance of Leaflet Fund	1	7	11
,, Amount due on Sale of "Nature Notes" in 1898	21	18	8
	£314	7	6

Expenditure and Liabilities.

	£	s.	d.
By Rent	15	15	0
,, Secretary	25	0	0
,, Postage	7	17	1
,, Stationery	0	8	6
,, Expenses of Annual General Meeting	6	14	2
,, Printing	21	3	10
,, Cost of "Nature Notes"	197	7	0
,, Miscellaneous Expenses	2	15	6
,, Balance	37	6	5
	£314	7	6

Deficit Account.

	£	s.	d.
To Surplus on 1898 Account	37	6	6
,, Balance (being the deficit on Dec. 31, 1898)	67	12	6
	£104	19	0

	£	s.	d.
By estimated deficit as shown in 1897 Account	92	19	0
,, Bad or doubtful debts in 1897	12	0	0
	£104	19	0

May 1, 1899.

(*Signed*) J. L. Otter,
Hon. Treasurer.

ANNUAL MEETING AND CONVERSAZIONE.

THE Annual Meeting and Conversazione of the Society was held at 20, Hanover Square, W., on Wednesday, May 31, the President, the Right Hon. Sir John Lubbock, being in the Chair.

The Annual Report being taken as read, the Chairman, after a few remarks, moved its adoption.

Rev. Professor Henslow said he had great pleasure in seconding the adoption of the Report. With regard to NATURE NOTES, he said he saw a great improvement in it under Professor Boulger's guidance. With reference to the New Forest, he did not know much himself; but from what the Chairman had told them, it seemed necessary that there should be some legislation with regard to the matter; and if he (the Chairman) could get Parliament to do anything on the lines suggested everyone would be grateful to him. As regards the so-called ospreys, it was strange that they could continue so long in fashion after there had been so much discussion about them by various societies and in the newspapers, and he wondered if there was not any means of getting the Court and the higher classes of the nation to help them in this matter. If they could be gained over, perhaps then the fashion could be changed. He had lately come from Ealing, and he could assure them that the birds in his garden there had always a good time: he had had wood pigeons building in the same tree for years, and had had gold-crested wrens and many others among his visitors. Now that he had come to London he should take the greatest care that the birds that came to his garden should have as good a time as at Ealing.

The Report was then unanimously adopted.

Letters were read from Sir Edward Grey, Lord Stamford and Mr. Bryce expressing their sympathy with the Society and their regret at not being able to be present.

Mr. Macpherson moved the election of the Officers.

Professor Boulger seconded Mr. Macpherson's proposal, and went on to say that he was sometimes asked what was the scope of the Selborne Society, and all he could say was that if any one would take a year's trial at compressing the work of the Society into the columns of a twenty-page magazine, they would soon find out what the scope was, and his difficulty was to get everything into the very limited space at his command. He was very glad to feel that he was so ably supported by such a number of contributors, but he had to appeal to the mercy of some of them, because he had a number of MSS. in hand and kept getting urgent letters asking if they had been received and when they would appear; whilst, unfortunately, he could only print twenty pages of matter in twenty pages, and so these MSS. had to wait, although it went very much against the grain with him

to keep them waiting. He was glad to say that each year of the life of the Society had been marked by a progressive growth; but there was one subject he had keenly at heart and that was the illustration of the magazine. At present they were dependent on the courtesy of publishers for the loan of blocks, and it very frequently happened that they would be very pleased to illustrate an article if only they had the funds. As the Treasurer was not present that evening, he could speak freely, and say that that was one thing for which they wanted money. Another point was that in each successive number he felt that someone would be displeased by the fact that certain subjects had been omitted. In the next number, some would say that Africa loomed very large to the exclusion of England; but space was limited. He also wanted to say something about the New Forest. It was a national question, and if the nation did not look after it he did not know who would. The Commoners would not—all they cared for was plenty of grazing ground for their horses and cattle. The Crown could not, as they were tied by Act of Parliament and could not even thin the woods under the existing Act. Another source of danger had been pointed out to him in a letter he had received, and that was with regard to the cutting of fern. The Commoners have no power to cut fern, but the Crown has, and in the cutting of this fern a number of seedling trees are destroyed. He agreed that the only way to preserve the Forest seemed to be by enclosing certain parts for a term of years until the young trees had become strong. This question of the Forest was one of the most urgent lying immediately before them. There was an immense amount of work to be done, and he hoped that no one would think that only those topics mentioned in the Magazine remained to be dealt with, for there were many others besides. This was the only occasion in the year when the general body of the members came together; but the Council met once or twice every month, and this involved a good deal of work, and they were very grateful to those who came there to do this work, and he had much pleasure, therefore, in seconding the election of the newly proposed Officers and Council.

The Hon. J. Scott Montagu said he must first express his regret that he was hardly in time to hear the opening words of the Chairman's remarks about the New Forest, as, taking the interest that he did in that part of the world and representing it in Parliament, he would have been pleased to hear what had been said. It was a very vexed question, and it had been in his mind a subject of great doubt for some years as to how it should be treated. He, among others, was very watchful to see that the Forest was preserved as a great national playground for the people, and he thought that it was pretty well agreed that, subject to the proper use of common rights, it was better to do entirely away with the idea that the Forest should be treated from the money point of view and that the Treasury should

expect to make money out of it. With regard to the old woods, he disagreed with the previous speaker, and said that it was only in certain parts, most observed by the public, that the old trees were falling down and were not being replaced; but in other less observed parts he would say that two-thirds of the old Forest was being replaced by the hand of nature, and so he did not think there was need to be very anxious upon that particular score; but the Selborne Society certainly ought to take a special interest in the New Forest and watch over its welfare. At the present time there was a Bill in the House of Commons which he hoped to see passed, and which was promoted by the Office of Woods and Forests, to try to settle the vexed questions between the Commoners and the Crown; and he should like to say this, that if the Bill was passed it would do away with a great deal of the friction now existing, and the Selborne and other Societies would find their work made very much easier. He was very happy to be able to speak to them on the subject, and would be very pleased to give them any information about the New Forest he could, and to assure them he was carefully watching over its welfare.

Professor F. E. Hulme said he had great pleasure in proposing a very hearty vote of thanks to the Chairman. They all knew that Sir John was an exceedingly busy man and hoped that he found some relaxation in coming among them. A remark had been made that most of the members only met once a year on an occasion like the present, but he thought that it would be a pleasant and desirable thing if they could meet oftener. As their delegate to the Conference of the South-eastern Union of Scientific Societies, he thought he ought to make a brief report to them. He duly attended the Conference at Rochester, and endeavoured as far as was in his power to maintain the objects of their Society. A certain amount of business was transacted and various rules passed and some amended which would make this Union still more valuable. He was also pleased to announce that, although no official announcement had yet been made, he believed on the next day the Gardens at Kew would be opened at 10 a.m.

Mr. A. J. Western seconded the vote of thanks to Sir John Lubbock.

This was carried unanimously; and, Sir John Lubbock having briefly returned thanks, the business part of the meeting closed.

In the Conversazione that followed, Mr. R. Kearton gave his lecture, "Wild Nature with a Camera," illustrated by magnificient slides, from photographs taken by Mr. C. Kearton, of birds and insects. In many cases the notes of the birds were cleverly imitated, and the extremely able and interesting account of the methods adopted to obtain the beautiful pictures thrown on the screen was closely followed by the delighted and interested audience.

Mr. Fred. Enock, F.L.S., F.E.S., followed with a description of the life-history of the Tiger Beetle, illustrated by coloured drawings which, depicted as they were with all the lecturer's well known accuracy and skill, enabled the members present to appreciate to the full the clear and instructive description of the various stages of this wonderful little beetle.

During the evening a series of slides illustrating the Vanishing African Fauna was shown by Dr. Graham Renshaw, of Manchester. The series included photographs of the eland, the kudu, the Cape hartebeest, the almost extinct bontebok, and the beisa antelope, which may have given rise to the fable of the unicorn. The differences between Burchell's zebra, common in menageries, and the mountain zebra were also demonstrated. The photograph of a living quagga was of special interest, as the animal is now wholly extinct.

It should also be mentioned that Mr. Enock very kindly undertook, in addition to his own demonstration, the supervision of the lantern during the whole evening, in the unavoidable absence of Mr. Ravenshaw.

On the first-floor, microscopes were exhibited by members of the Quekett and Royal Microscopical Societies, and a series of pictures and objects of interest kindly lent by Messrs. G. Renshaw, J. E. Cooper, A. W. Dennis, A. E. Hilton, Ernest Hinton, J. F. Holder and A. H. Macpherson, Miss Spiers, Miss Charlotte Spiers, Mr. C Turnerly and others.

SELBORNIANA.

Our Contemporaries.—We have previously had occasion to remark on the many healthy signs of the attitude of the general press on Selbornian matters. The *Contemporary Review* for May had an interesting "Plea for Wild Animals," by W. J. Stillman. The *Outlook* for June 10 had a charming appreciation of Gilbert White from the pen of P. Anderson Graham. The *Daily News* of May 13 contained an article on "Birds in the fruit garden, their services and their wages." The following is from a review of "The Records of Sheffield" in the *Athenæum* for May 20:—

"It was much to the credit of the Sheffield burgesses that in the middle of the last century, when even good men took so little heed of the sufferings of the lower animals, they were earnest in their endeavours to suppress the cruel sport of cock-throwing, which had been from time immemorial a popular diversion on Shrove Tuesday. It is not easy to account for the callousness of men until quite modern days as to the sufferings of the brutes. The best of us are but a very little in advance of our own time. It is alleged, on what seems good authority, that Sir Thomas More was skilful in this revolting pastime. In 1752 these [Sheffield] accounts contain an entry of 5s. paid for dispersing handbills condemning the sport, and five years after 14s. 6d. was paid to the 'cricket players on Shrove Tuesday to entertain the populace and prevent the infamous practice

of throwing at cocks.' There are many excellent reasons why cricket should meet with encouragement and support, but we have been hitherto unaware that it had been found useful as a preventive of cruelty."

HIND-HUNTING ON EXMOOR.—At the end of April a series of letters appeared in the *Standard* calling attention to the barbarous practice of hunting hinds heavy with calf, which has been carried on of late years by the Devon and Somerset Staghounds. It is no excuse for this inhuman practice that it is necessary to reduce the number of deer on Exmoor in the interest of the farmers. That could be done otherwise.

THE DOOMED OTTER.—The *Daily Mail* of April 9 very rightly called attention to the payment of a reward of £2, paid recently, for the killing of three otters, by the Thames Angling Preservation Society. As the *Daily Mail* points out, persons so killing otters or other animals or birds on the river-bank or towing-path, or inciting others to do so, are liable, under the bye-laws of the Thames Conservancy, to a penalty of £10. This is the law, which is not affected by any increase or decrease in the number of otters.

WHOLESALE SLAUGHTER OF KINGFISHERS.—Although very possibly the kingfisher is in some districts as plentiful as ever, when one hotel proprietor can point to a case containing between seventy and eighty specimens as "a fine winter's sport," as is recorded by Mr. W. P. Westell in the *Standard* for May 22, further protection for this beautiful bird is obviously necessary.

THE HERON ON THE NORFOLK BROADS.— A correspondent writes to us, under date May 7 :—" Could you, and the Society, do anything to stop the decrease of herons on and about the Norfolk Broads? They are in no danger of extermination at present, but, according to an article in yesterday's *Country Life*, the ubiquitous cockney sportsman is reducing their numbers quite perceptibly. The above-mentioned article contains a suggestion that there should be legal protection for this harmless and beautiful bird, the largest of our wild marsh fauna."

A TALE FOR A DONKEY.—A Liverpool bird-catcher charged with using a decoy lark and a net for catching larks, explained to the police that he had only taken his lark out to teach it to sing by listening to other larks, and that the net was to keep dogs away. The police-sergeant replied that if he told that yarn to a donkey it would kick him.

OBSERVATIONS FOR YOUNG BOTANISTS.

VII.—Special Modifications and Adaptations of Leaves.

WE have already considered the duties of an ordinary or typical leaf; but since Nature is never at a loss for resources where some special work is required to be done, she frequently diverts the functions of leaves into other channels, to suit new habits or to fit the plant better to special surroundings. A brief allusion has already been made to such cases—as of fleshy leaves in deserts, constructed to store water—but it will be as well to devote an article to this subject.

Climbing Plants.—Mention has been made of the *Clematis*, of which we have one native species, *C. Vitalba*, the traveller's joy. It has a compound leaf of five leaflets which are jointed, so are readily disarticulated in autumn and fall off; but the petioles are required for supporting the plant. This they do by being very sensitive to touch, so that when they press against twigs in a hedge they soon coil round it. Now a certain amount of weight is, so to say, "felt" by the leaf-stalk, as it helps to support the plant. And just as a muscle of the arm increases in size if weights are frequently lifted, so does this leaf-stalk. If a cross section be examined *before* and some weeks *after* a leaf has caught hold of a twig, the fibro-vascular cords will be found increased in size. As a consequence of utilising the leaf-stalks for climbing, the blades in some other plants become more or less arrested, or even lost altogether. Thus in the garden pea, a portion of the leaflets are gone, and in their places are fine thread-like tendrils highly sensitive to touch. They represent the mid-ribs of the little blades. Now comes into play the principle of "compensation;" for to make up for the loss of the blades, the stipules are very much enlarged. In one of our wild peas, *Lathyrus Aphaca*, they undertake all the leaf-functions, as the leaf is altogether in the form of a tendril.

In the wild bryony (*Bryonia dioica*) the long tendril is of the nature of a stipule. At first it projects out stiffly, and is in constant but slow motion so as to catch hold of something. As soon as the hooked tip has secured a hold it grips the object tightly; and then the tendril coils itself up into a number of corkscrew-like turns. An interesting thing must now be observed, viz., that some of the coils run to the right, others to the left, and the number is always about the same either way. The meaning of this is that by twisting the tendril it becomes stronger, but is strained, and unless it is, so to say, untwisted by reversing the coils, it might break. Tie a piece of string to some object, and when stretched to its full length twist it for some time one way. Then slightly relax the string and it twists upon itself to relieve the strain to which you have subjected it. Or take a long piece of ribbon, and you will find that to "do it up" neatly you must twist it like a figure of

eight on two fingers, not round and round. We thus see how plants have to obey mechanical laws as well as we!

Insectivorous Plants.—Our commonest sundew (*Drosera rotundifolia*) is often found among bog-moss in morasses, so that most students may have the opportunity of examining it. Its little green, round blades are covered with stiff bristle-like processes called "tentacles," terminated by a gland which secretes a drop of gum, looking like dew, whence its name. A few plants in moss should be put into a soup-plate of water. Then place a tiny fragment of hard-boiled white of egg, gently laid upon the short tentacles in the middle of the leaf-blade. It should be examined from time to time. It will be seen that the longer marginal tentacles bend over it, although they had not touched it, and bring their glands down upon the food. The glands now pour out a digestive fluid, dissolving the white of egg, which gradually becomes semi-transparent till it is all gone. While this is going on the naturally uniformly pink-coloured tentacles become much paler in tint. This means that the "nitrogenous" food is being conveyed down the tentacles into the leaf. After a time, the tentacles rise up and spread themselves outwards as they were at first, while they regain their colour, from below upwards, and are then ready for a fresh meal. Indigestible substances, such as hard cheese, potted meat, or the hard skin of an insect are either rejected or else they kill the tentacles.

The butterwort (*Pinguicula vulgaris*) is very common in moist places in the west of England. It has a rosette of pale yellow-green spoon-shaped leaves. These are covered with stalked glands visible through a lens; and if a piece of egg be placed on the leaf the margins soon roll over it so as to place the marginal glands on it. They then pour out a digestive fluid as before in the case of the sun-dew. The chief use of this peculiar habit of eating animal food is to enhance the fruiting and seeding, as experiments show that many more seeds are produced if the sun-dew plants be fed, than if they are not so treated.

Propagation.—All parts of plants are capable of reproducing the plant, though flowers and fruits are, of course, the principal means. Leaves form no exception, and advantage is taken by florists of this means of multiplying certain plants, such as begonias and gloxinias, by cutting up a leaf, as each of its pieces will strike root and then throw up a bud.

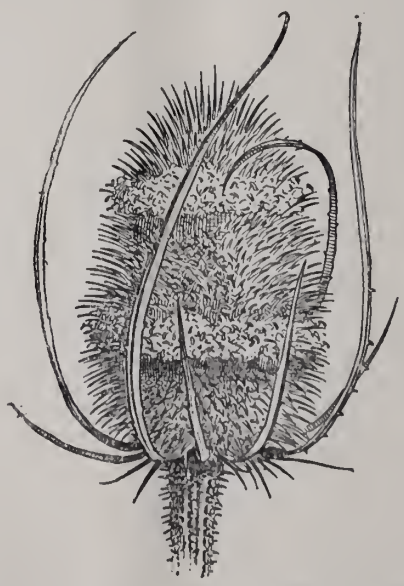
Some plants, however, habitually produce buds on leaves. There is a fern, commonly grown in conservatories, the fronds of which are covered with little buds which can be detached and grown. A peculiar water-lily always carries a bud at the top of the leaf-stalk at the notch in the blade; while a fleshy-leaved plant of Madeira (*Bryophyllum*) sheds its leaves while still green. They fall on the ground and strike root at every notch, and then a bud springs up at the same place; and so one leaf may give rise to half-a-dozen little plants. Our own cuckoo-flower (*Cardamine pratensis*) often has its leaves flat on the ground, and in moist places these will strike root.

Store-Houses of Nutriment.—To act in this way, the leaf is usually reduced to a scale representing the stalk only, as in bulb-scales of lilies. If the scale surrounds the stem, as in the onion, it is called "tunicated." The *meaning* of such a sheathing scale is that its real use is to supply strength to support the blades. This is admirably seen in gigantic palm-leaves; and if the student, when at Kew, will take the opportunity to examine some of the palms there, he will observe in old decaying bases of the leaves how the fibres not only go all round the trunk, but cross each other like lattice-work, giving great additional strength to sustain the enormous weight which some palm-leaves have. The fleshy scales of the onion, however, are only required for storing up nourishment.

REVIEWS AND EXCHANGES.

Rambles with Nature Students. By Mrs. Brightwen, F.E.S. Illustrated by Theo. Carreras. Religious Tract Society. Price 5s.

Mrs. Brightwen is a charming companion for a ramble, no matter in what department of natural history our special interest may lie; and her copiously illustrated volume, arranged according to the months, though rather too heavy

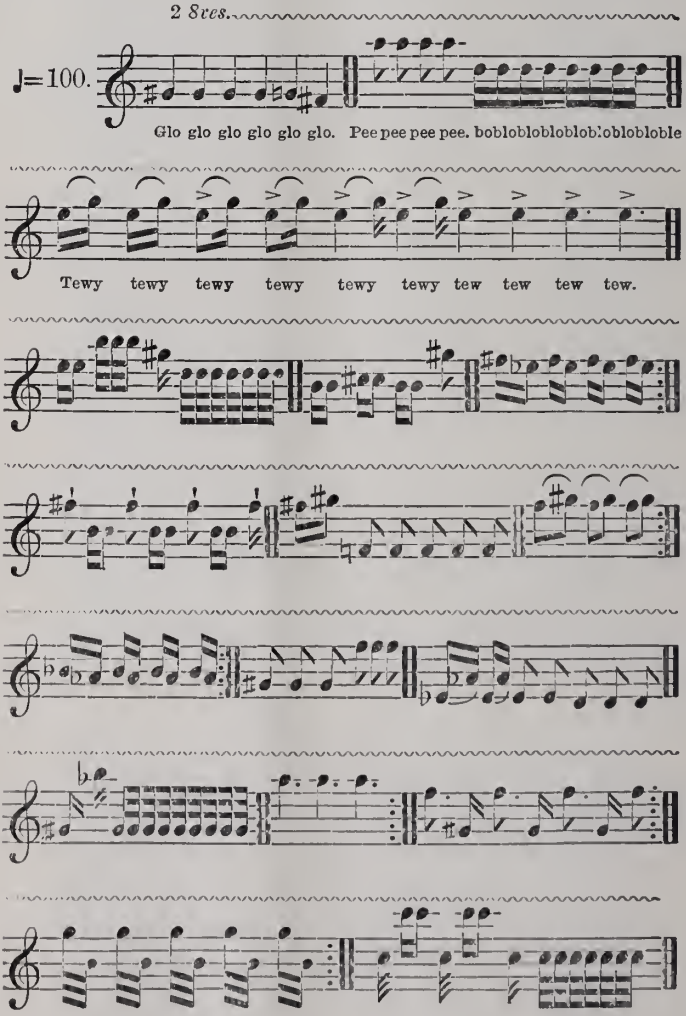


Teasel Head (natural size, to show bands of florets).

for the pocket, owing to the glazed paper now so popular with publishers, is a most instructive and interesting guide in the study. To give some idea of the varied scope of the work in the limited space at our command we cannot do

THE GREAT WATER-BEETLE (*Dytiscus marginalis*) and larva (natural size).

DRAGON-FLY LARVA (natural size).

better than enumerate the topics chosen for July, which, by the courtesy of the publishers, we are able to illustrate by three, out of the eight, of Mr. Carreras' excellent drawings, which are apportioned to this month. Amber, rocks and stones, the teasel, succory, and fishing for insects are the subjects of the paragraphs in this particular section of the book, and we have some pleasantly didactic discourse, obviously based upon personal observation, on each. As Mrs. Brightwen most encouragingly remarks, almost all her rambles and notes may be carried out or verified even in the near neighbourhood of our largest towns. This makes the present work one admirably suited for a school-prize, whether in town or country.

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♩=100.
Glo glo glo glo glo glo. Pee pee pee pee. bobloblobloblobloblobloble
Tewy tewy tewy tewy tewy tewy tew tew tew tew.

Cries and Call-Notes of Wild Birds. With musical illustrations. By C. A. Witchell. L. Upcott Gill. Price 1s.

Many of our readers are, we know, much interested in the notes of birds; so that we are glad to be able to direct their attention to a handy guide to the

subject from the pen of such a recognised authority as Mr. Witchell. As an example of the musical illustrations, which, the author suggests, should be first played on the piano and then whistled, we give, by permission of the publisher, the various strains of the nightingale here recorded. The second of these is, we are told, "one of the commonest, and it is given in any interval between a third and an octave. Curiously enough, this strain, given with the tone of the nightingale, constitutes the entire song of a bush-warbler in Western Canada, where bird-songs are few and far between. The third strain shows how the nightingale sometimes elaborates a little call-note into his lovely long notes; and the inference is that the transition which the bird now effects in five seconds may have taken the species five ages to traverse in acquiring its characteristic long notes." The book has an index, which makes us more tolerant of the author's awkward classification of his subject. It might, we think, be worth the publisher's while to issue so useful a handbook in a cloth cover.

Hey, for the Holidays! By Walker Miles. R. E. Taylor & Son. Price 6d.

This little book, which may serve to usefully wile away an hour in the train, contains, besides some general hints on holiday making, three samples of Mr. "Walker Miles's" admirably practical rambling guides, from Shalford to Puttenham and Guildford, from Maidstone to Leeds Castle and the Hollingbourne Caves, and from Balcombe to East Grinstead. To these are appended a lengthy effusion in verse.

Science-Gossip for June contains the beginning of "A History of Chalk," by E. A. Martin, F.G.S.

The Animals' Friend for June has the first instalment of a paper on "Butterflies and their Uses."

In *The Teachers' Review* for June, Mr. Walter Johnson, of Battersea, continues "A year's Nature Notes in a London School."

Received: — *Animal World* for May and June; *Our Animal Friends*, *Humanity*, *Knowledge*, *The Naturalist*, *The Irish Naturalist*, and *The Agricultural Economist* for June.

NATURAL HISTORY NOTES AND QUERIES.

Curious Nesting Places.—At this season the papers are full of letters as to eccentric nesting places chosen by birds. The *Star* of May 16 has an illustration of the carcase of a cat hung on a tree in Bromley Wood, Kent, chosen by a wren as a suitable nesting site. The *Midland Free Press* of May 20 gives a drawing of a tom-tit's nest in the interior of a dry pump. Robins seem to be ecclesiastically minded. The Rev. J. W. F. Walker writes from St. Stephen's Vicarage, Tovil, Maidstone, to the *Standard:* "Yesterday the drawing-room window had been left open all day, and the room was unoccupied. In the evening, when the window was being closed, a considerable amount of litter, in the form of dry leaves, &c., was noticed on the floor. The reason of this being investigated, it was discovered that a pair of robins had selected a corner of the mantelpiece, behind a photograph frame, as a convenient nesting place, and during the day they had accumulated enough material to fill an ordinary dust-pan. Fond as we are of birds, we were reluctantly compelled to forbid this invasion on the part of the robins."

In the same paper a few days before it was recorded that some robins have recently built nests in no fewer than three of the organ pipes in St. Augustin's Church, Bournemouth. At first the choir boys were remonstrated with for bringing rubbish into the church, but the sexton eventually discovered that the offenders were robins, who were seen to enter by the sanctuary window whenever it was open and fly down to the organ. They entered by the "slot" at the base of the pipes, and an examination discovered three nests which were nearly completed

Although the nests were destroyed, the robins continue their attempts to nest in the strange place to which they have taken a fancy, and quite recently have been seen perched on the altar of the church, which is close to the window by which they enter.

One of the most noteworthy cases that has recently reached us is the following :—The "gantry" or elevated platform at Shoeburyness, which carries the travelling crane used in moving the great guns, has lately been extended. On removing a part of the platform in order to carry out the work several nests were found, both of sparrows and starlings, the latter with eggs or young birds, to which the parent birds persistently returned when driven off. These nests were almost immediately over or within a very short distance of the heavy ordnance, including the 80-ton gun, yet the birds appeared to have suffered no serious inconvenience from the firing.

Nesting Twice in the Same Nest.—Few birds resort to the same nest twice in the year, and the reason is not far to seek. An old nest is more liable to discovery than a new one, from having been longer made ; and a second brood in it is exposed to extra danger. It also encourages idleness and carelessness in the builders. Against the many objections Nature seems to have provided a remedy in the shape of parasites of different kinds. When the brood has quitted the nest a legacy is generally left behind of fleas, ticks, and even those formidable creatures that thrive so well in the metropolis. These, ever on the prowl, and thirsting for the blood of any suitable animal that ventures near their hiding place, act as a hindrance to a second venture. Everything has its use, and this, it seems to me, is one of the uses invented by Dame Nature for an objectionable class. I have known domestic hens so worried by fleas in a fashionable nest as to be driven to desert their eggs.

Market Weston, Thetford, June, 1899. EDMUND THOS. DAUBENY.

Dropped Starlings' Eggs.—In answer to your correspondent, W., I think it is probable that the eggs found on the ground would have, on examination, proved to be addled, and that the parent birds had themselves removed them from the nest. I have myself found the eggs of the common house-sparrow lying on the ground in the same way. Young birds that die in the nest seem also to be removed by their parents, as I have found several dead nestlings quite unable of their own accord to have reached the places in which I observed them. My own series (found dead) is as follows :—(1) Nestling, probably meadow pipit, wing quills, and dorsal feather-tract well developed, Lytham, Lancashire, May 4, 1896 ; (2) Nestling, house-sparrow, Sale, 1898 ; (3) Nestling, house-sparrow, naked, Sale, May 22, 1899, and others.

Sale Bridge House, Sale, Manchester. GRAHAM RENSHAW.

The Cuckoo "Myth."—It may interest Mr. Otter and others to know that I have *found my bottle* containing the eggs and a young green linnet half-grown, which the young cuckoo I have before referred to cast out of the nest. I preserved them in methylated spirits some six years ago. In the bottle also is a young cuckoo, hatched in a green linnet's nest, which died for the want of natural food ; it is even smaller than when hatched, and may be the smallest cuckoo in preservation.

JAMES HIAM.

It seems to me that your correspondents miss the point of Mr. Joseph Collinson's letter. He does not deny that the young birds are ejected by the young cuckoo : his contention is that, though the young ultimately find themselves on the wrong side of the nest, the action of the strong fellow in possession is quite unintentional. Jenner's story is that the act is deliberately planned, the young cuckoo being, in his opinion, actually designed by providence with a dent in his back so as to be able to accomplish the work in the best form. This and the eviction, as described by Jenner, are the "facts" which I, along with Mr. Collinson, Dr. Charles Creighton, Dr. Norman Moore, Dr. Green, and a long list of other reliable students of Nature, find it impossible to swallow.

Durham City, June 9, 1899. J. F. H.

The correspondence in NATURE NOTES about the ejective instinct of the young cuckoo discloses but one sceptic, and, in view of Dr. Sharpe's treatment in "Wonders of the Bird World," and recent references to the subject elsewhere, the affirmative argument has, perhaps, been sufficiently maintained. But a few words about Edward Jenner's paper, published in the *Philosophical Transactions of the Royal Society* for 1788, seem to be required. Jenner's credit has been blasted by Waterton: his account has been neglected by Dr. Sharpe; and his biographer, Dr. Norman Moore, in the "Dictionary of National Biography," a compilation of repute, in his wish to reconcile his own scepticism with the veracity of Jenner, has been enabled to declare that the account "is clearly not the result of Jenner's own observations." The passage is: "The peculiarities of the cuckoo's habits are ably discussed, but the account of the cuckoo removing the young hedge-sparrows is clearly not the result of Jenner's own observation, and Waterton has demonstrated its absurdity. The explanation appears to be that Jenner employed a boy, his nephew Henry, to make these observations, who, too indolent to watch, gave an imaginary report."

Now it will surprise any one, on reading Jenner's paper, to find that so far from the account being "clearly not the result of Jenner's own observation," nothing can be more clear than that it is—or, to be precise,—professes to be. For example: "The nest," he writes, "was placed so near the extremity of a hedge that *I* could distinctly see what was going forward."

Jenner describes five cases of observation of nestling cuckoos. In four he is himself the observer: in one he is not, and is careful to point out the defect. The evidence in this case is, however, not relevant to the question of ejection. The circumstances were as follows:—It had been suggested, as a cause of the parasitic habit of the cuckoo, that its form was not adapted to incubation. As a test Jenner, in the summer of 1786, placed two wagtails' eggs in a nest with a young cuckoo about a fortnight old, and, the nest being at some distance from his house, set a person to watch. On the ninth day he was told that the eggs were hatched. He went and saw the broken shells, but no young wagtails. He adds: "The fact, therefore, of the birds being hatched I do not give you as coming immediately under my own eye, but the testimony of the person appointed to watch the nest was corroborated by that of another witness." At this time Jenner did not suspect the young cuckoo of throwing out its companions. It may be asked, Why did not this young cuckoo throw out the wagtails' eggs? Also other questions might be asked if the case were worth regarding apart from its evidence of Jenner's desire for accuracy.

Is it possible that the person set to watch the wagtails' eggs has become the indolent and imaginative boy of Dr. Moore's "explanation"?

Of the four cases in which Jenner was himself the observer, in one he actually saw the process of ejection: in the others he noticed facts which are circumstantial evidence of ejection. As the *Philosophical Transactions* for 1788 are not very readily accessible a summary of his account may be acceptable.

On June 20, 1786, Jenner noticed that a cuckoo's egg in a hedge-sparrow's nest, which was under observation, had been hatched. The young cuckoo was the sole occupant of the nest, a young hedge-sparrow lying dead on the ground, and a hedge-sparrow's egg being caught in the material of the outside of the nest. The egg was put back, again ejected, and again saved in the same manner. The cuckoo was then taken out and the egg put back. A quarter of an hour afterwards the egg was hatched and the young bird "warm and lively." Three hours after that the cuckoo was put back. The young hedge-sparrow was then ejected. It was restored, and again ejected. After each experiment Jenner retired, the old birds being anxious and fearful.

On June 18, 1787, Jenner examined the nest of a hedge-sparrow containing one cuckoo's and three hedge-sparrows' eggs. On the day following the eggs were hatched, but the nest only contained one hedge-sparrow besides the cuckoo. This is the "leading case," and I quote Jenner's own words:—"The nest was placed so near the extremity of a hedge that I could distinctly see what was going forward in it. The little animal, with the assistance of its rump and wings, contrived to get the bird upon its back and, making a lodgment for the burden by elevating its elbows, clambered backward with it up the side of the nest till it reached the top, where, resting for a moment, it threw off its load with

a jerk and quite disengaged it from the nest. It remained in this situation for a short time, feeling about with the extremity of its wings as if to be convinced whether the business was properly executed, and then dropped into the nest again. With these (the extremities of its wings) I have often seen it examine, as it were, an egg and nestling before it began its operations; and the nice sensibility which these parts appeared to possess seemed sufficiently to compensate the want of sight which as yet it was destitute of. I afterwards put in an egg, and this by a similar process was conveyed to the edge of the nest and thrown out. These experiments I have since repeated several times in different nests and have always found the young cuckoo disposed to act in the same manner."

On June 27, 1787, two cuckoos' eggs and one hedge-sparrow's were hatched in a nest under Jenner's notice, one hedge-sparrow's egg remaining unhatched. In a few hours a contest began between the two cuckoos, and was undetermined till the next afternoon, when one, rather larger, turned out the other, the young hedge-sparrow, and the egg. Each cuckoo alternately appeared to have the advantage, carrying the other nearly to the top of the nest, and then sinking down exhausted.

On July 9, 1787, a young cuckoo in a nest was confined, so that it could not turn out its fellow nestlings. It incessantly made attempts to do so. This nest was plundered, so the issue of the experiment could not be noted.

Mrs. Blackburn's account of the process of ejectment agrees in its details to a high degree with Jenner's.

There is much else about cuckoos in Jenner's paper of great interest. It was written at the request of John Hunter, and read before the Royal Society. It bears strong internal marks of authenticity, and can only be impugned as to essentials at the cost of Jenner's veracity. Subsequent corroboration may now restore it to credit as a remarkable and instructive contribution to our knowledge of the species.

J. L. Otter.

Insectivorous Birds and the Cabbage White.—Noticing some time back the question as to the diminution or otherwise in the numbers of the cabbage butterfly, I can say from my experience that they flourish in our district and in our garden. The *Pieris brassicæ* was abundant last year and the previous year, and is now plentiful, flying about the garden. Tall nasturtiums suffered in the year 1897. Next year, those plants being few, they throve upon another plant of the genus (*Tropæolum aduncum*), the canary creeper. In each case, wanting some of the caterpillars for the chrysalis state, I was in no hurry to collect them, knowing they would not be molested by the insectivorous birds, of which an abundance frequent the garden. From actual trials I know neither the robin nor the skylark will eat them, and as for the sparrows, they prefer stealing the poultry food, doing great mischief in the garden on the pinks, carnations, and other plants of the genus Dianthus. In the latter case they devoured a pot full of choice seedlings on a first-floor window-sill, entering into the window also to eat another pot-full, though paying assiduous attention to the kitchen waste in the same alley. With the sweet peas it is a race as to whom the ripe seeds shall belong. The victory is almost complete with the sparrow. This is only a portion of the mischief they do. Earwigs may lie quietly in Godetias until I pick them out, yet I should have thought the birds' sight was sharper than mine, but the will is wanting.

Elstree, June 9, 1899. H. J. B.

Fernwebs, as they are locally called, are very plentiful just now on and about Dartmoor. They are easily caught in the hand as they fly amongst grass and fern, and are a very deadly bait for trout. Starlings during the past few days have been about in flocks picking them up. I enclose specimens of this small, reddish-brown beetle, and should be glad to know its proper name, which I have never heard. Some years it does not put in an appearance at all; but when it does, local fishermen rejoice. Fernwebs are looked for as the fronds of the bracken open out. I think the artificial fly corresponding is the Red Palmer with black head. The common cockchafer is here known as the oakweb.

Creaber, Gidley, Dartmoor, June 15, 1899. Giles A. Daubeny.

[Fern-webs is one of several popular names, such as field-chafer, fern-shaw beetle, &c., for *Phyllopertha horticola*, a near ally of the common cock-chafer, *Melolontha vulgaris*.—Ed. *N.N.*]

Abnormal Dandelion.—Mr. Courthope's note on abnormal blue-bells reminds me that I found an abnormal dandelion (*Taraxacum officinale*) in the field adjacent to this house a few years ago. The specimen, which now lies before me, has a double capitulum (*dichotomous*), each capitulum being well developed and surrounded by its own involucre of bracts. Pappus well developed. The rest of the plant, which I examined as it stood in the ground, seemed absolutely normal. A careful search in the rich series illustrating teratological botany in the Royal College of Surgeons' Museum, has not resulted in the discovery of a similar specimen.

Sale Bridge House, Sale, Manchester. GRAHAM RENSHAW.

SELBORNE SOCIETY NOTICES.

Subscriptions.—The following have increased their subscriptions:—Captain J. Cundy, £3 (3 years' subscription); Fred. Enock, Esq., F.L.S., F.E.S., 7s. 6d.; E. S. Morphew, Esq., £2 2s. (2 years' subscription); Dudley W. Buxton, Esq., M.D., D.Sc., M.R.C.P., 21s. (2 years' subscription); Mrs. M. Wolryche-Whitmore, 10s.

Donations towards the reduction of the Deficit.—The Council acknowledges with thanks the receipt of the following donations:—A. H. Macpherson, Esq., B.C.L., M.A., F.Z.S., £1; Mrs. Martelli, £1; Miss A. L. Thomas, £1.

Books presented to the Library.—Sir John Lubbock's "On Buds and Stipules," by the Editor; "Wild Nature with a Camera," C. and R. Kearton, by Mr. J. L. Otter.

Meetings of Council.—The next meetings of the Council will be held on Tuesdays, July 4 and 18, at 5.30

At the Council Meeting held on June 6 it was resolved to hold the Council Meetings on the first and third Tuesdays in each month, instead of only once a month as heretofore.

Field Club Rambles:—

Saturday, July 8.—Kew Gardens. Meet at Victoria Gate, 3.30. Frequent trains to Kew Gardens Station *viâ* Metropolitan, South Western, District and North London lines. Tea in the grounds. Guide, Professor F. E. Hulme, F.L.S.

Saturday, July 15.—Betchworth and the Buckland Hills. Book to Betchworth by South Eastern Railway. Train leaves Cannon Street, 3.5; London Bridge, 3.7; East Croydon, 3.29; arriving 4.5. Return trains, 7.21, 8.27, 9.35, Return fare, 3s. 3d. Guide, Mr. A. E. Bradley.

Saturday, July 22.—Uxbridge to Denham by the river Colne and canal. Meet at Uxbridge Station on arrival of 2.53 train, Paddington 2.53, Ealing, 3.7. Guide, Mrs. Percy Myles. Return fare, 2s. 2d.

Saturday, July 29.—Potters Bar, North and South Mimms. Train leaves Broad Street 2.17, arrives Potters Bar, 3.5. Walk to South Mimms through Hawkshead Wood and North Mimms Park to North Mimms. Tea at latter place. North and South Mimms both have very interesting churches and good brasses. Return ticket to Potters Bar, 2s. 3d. Guide, Mr. S. Austin.

NEWS FROM THE BRANCHES.

Bath.—A very enjoyable ramble was taken on Thursday, May 25, to the quaint old village of Norton St. Philip, celebrated for its old timber inn, one of the bygone relics of the past. Colonel Bingham Wright conducted the party, which came by train, to Wellow. From here a very pretty road and lane were traversed; it was probably the very same road as that by which the Duke of

Monmouth marched two centuries ago. The weather then had been very wet, and the road so bad that much of the baggage had to be left at a place since called Baggeridge Farm. The lanes and hedgerows were abundant with spring flowers, but contained nothing of much rarity. On arrival at the village the church was first inspected, and then a substantial tea was partaken at the celebrated "George."

Thursday, June 8.—A perfect June day for the Selbornian excursion to the beautiful vale of Limpley Stoke, near Bath. On arriving at the station the party, about thirty in number, proceeded through the grounds of the hydropathic establishment, and afterwards to the beautiful woods, full of choice flowers, by permission of the owner, J. Hayward, Esq. He and the Rev. W. S. H. Samler conducted the party, and the botanists found many rare flowers, including the beautifully scented butterfly. Mrs. Hayward had kindly invited the members to tea in her pretty garden at Aroona, which was laid out on a terrace overlooking the fertile vales of Freshford and Limpley Stoke, the heat of the sun being tempered by a delightful breeze. After tea the members strolled round the grounds, when ices were handed round, and some even indulged in a novel swing, a specialty of this garden, which holds about ten people. It did not look very scientific, but enjoyable.

The Annual Meeting was held on June 27, when the President of the Branch, Mr. H. D. Skrine, J.P., D.L., referred to the successful efforts made by the Branch, through him, to prevent the slaughter of herons and kingfishers on Corporation property, and stated that he was trying to stop the practice of setting traps for wildfowl. The report showed that the Branch now has about 300 members, and is financially prosperous. The officers were re-elected.

ANSWERS TO CORRESPONDENTS.

W. A. Dutt.—*Asperula arvensis*, L., a cornfield casual, wild in Central Europe. *Marrubium Alysson*, L., a native of the Mediterranean region.

A. W. H.—*Carex præcox.*

Miss H. Catt.—The common swan (*Cygnus olor*) sits between five and six weeks.

Florence A. Pitts.—The jumping-bean Tortrix (*Ernarmonia saltitans*) is a native of Mexico. Its larva lives in the seeds of a plant called *Calliguaja*. The perfect moth is ¾-in. across, with greyish-white fore-wings, varied with ash-coloured markings, and brown hind-wings. See vol. v. of Mr. W. F. Kirby's "Handbook of the Lepidoptera," plate cliv. (in Allen's or Lloyd's "Natural History"), where "bean," pupa and imago are figured.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S. As he will be out of town during August, they should, from July 25 to August 31, be sent to "care of MESSRS. JOHN BALE, SONS & DANIELSSON, Great Titchfield Street, W." Letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 116. AUGUST, 1899. Vol. X.

SELBORNIANA.

Our Balance Sheet for 1898.—Owing to a mistake in transcription, for which our Hon. Treasurer was in no way answerable, the balance sheet printed in our last issue was erroneous, so a correct one is here given.

The International Congress of Women and Dress in Relation to Animal Life.—We are glad to be able to report the discussion which occupied the attention of the social section of the International Congress of Women on July 3.

The Duchess of Portland, who presided, said that she had to plead for a simple and old-fashioned cause. Every liberal effort on the part of women suffered from the fact that they were suspected, without practical reason, of never meaning what they said. If they proposed the removal of a pressing and admitted grievance, they were met with the criticism that what they advocated would only be used as a stepping-stone to something very undesirable, if not positively dangerous. Luckily for them, their critics must stick to the point, for there was only one to urge. Moreover, they were a homogeneous body, if a small and unimportant one. They had none of the differences between the van and rear that sometimes threw the whole main body into confusion. It had often been urged by critics and opponents, unchivalrous enough not to give them the benefit of the doubt, that women would cease to pity when they came to power, and would assimilate the qualities on which men relied in the battle of life. Their presence showed that if they were to learn liberty, they did not mean to forget kind-heartedness and love. No further apology was necessary for pressing the cause on the attention of every one possessing womanly sympathy and spirit even in the midst of higher themes and more urgent questions.

Dr. FINANCIAL STATEMENT FOR THE YEAR ENDED DEC. 31, 1898. Cr.

General Fund.

Receipts and debts due.	£	s.	d.	*Expenditure and Liabilities.*	£	s.	d.
To Subscriptions	127	16	11	By Rent	15	15	0
,, ,, paid over by Branches	12	13	1	,, Secretary	25	0	0
,, Donations	52	3	0	,, Postage	7	17	1
,, Sale of "Nature Notes"	83	13	11	,, Stationery	0	8	6
,, Percentage on Receipts of Branches	12	5	3	,, Expenses of Annual General Meeting	8	14	2
,, Sale of Badges	2	8	9	,, Printing	21	3	10
,, Balance of Leaflet Fund	1	7	11	,, Cost of "Nature Notes"	197	7	0
,, Amount due on Sale of "Nature Notes" in 1898 ...	21	18	8	,, Miscellaneous Expenses	2	15	6
				,, Balance	35	6	5
	£314	7	6		£314	7	6

Deficit Account.

	£	s.	d.		£	s.	d.
To Surplus on 1898 Account	35	6	5	By estimated deficit as shown in 1897 Account	92	19	0
,, Balance (being the deficit on Dec. 31, 1898)	69	12	7	,, Bad or doubtful debts in 1897	12	0	0
	£104	19	0		£104	19	0

May 1, 1899.

(*Signed*) J. L. Otter,
Hon. Treasurer.

Mrs. F. E. Lemon, F.Z.S., Hon. Sec. Society for the Protection of Birds, then read the following paper :—

"The subject of which I have been asked to treat is Dress in relation to Animal Life. I do not think there is any necessity to enter into details regarding the proper treatment which should be accorded to those animals which provide us with woollen, silken, or leathern goods. These materials are mostly obtained from domesticated animals, who in Great Britain, as well as in many other countries, are now protected by law.

"I regret that I am not competent to deal with the important question of the protection of which many fur-bearing animals stand in need, and I hope that other speakers will deal with this subject. Undoubtedly, terrible abuses exist: many beautiful and useful animals are becoming extinct because they are hunted and killed without due regard to the breeding season, and we know that indescribable cruelties have been practised in the killing and skinning of the fur-bearing seals, and in the procuring of certain kinds of astrachan, which is the skin of the unborn lamb.

"Surely it behoves all right-minded women who would array themselves in these costly materials to make strict enquiry as to the way in which the material is obtained. Until it has been undeniably proved that before being skinned the seal has been swiftly and mercifully killed, and that the hunting is not carried on during the breeding season, we should do well to avoid the use of that fur. If all women would thus protest, the hunters would perforce have to mend their methods. The same course of action would also doubtless bring about more humane treatment of the other creatures whose skins are obtained that we may be covered and kept warm.

"With these brief allusions I now turn to my special subject, that of Bird Protection; and here I shall speak with no uncertain sound, for what I shall say is based on positive knowledge laboriously gathered during many years devoted to the question.

"Unfortunately it is through women and their weak submission to the dictates of what is known as Fashion that much of the wholesale and disastrous slaughter of bird life has taken place. The question is not a sentimental one, it is a serious and economic one. Game-keepers and others, in ignorance, and from desire of some immediate pecuniary gain, have destroyed owls and kestrels to an alarming extent, and in consequence rats, mice, and voles unmolested are playing terrible havoc in the fields and in the farmyard. But judging by the owls' and kestrels' feathers that women display on their hats, and the numbers of these birds one has seen on their way from the London Docks to the plumassiers, women cannot be held guiltless in the matter of the destruction of these most useful and necessary birds. The late Lord Lilford, then Presi-

dent of the British Ornithologists' Union, said that the fittest place for the wilful destroyer of any owl in this country was an asylum for idiots.

"It is a disgrace to civilisation that, in order to pander to the appetites of epicures, we are allowing that glad songster, the skylark, to be destroyed by millions. During the season 30,000 to 40,000 skylarks are *daily* brought into London for eating.

"The rich man's demand for plovers' eggs in the spring, and for their flesh in the autumn, has meant such an increase of wireworms in some districts as to put the farmers in despair. To kill a wild bird as well as to eat its eggs has been characterised by Sir Herbert Maxwell as most unfair dealing, and compared to burning the candle at both ends. No species of wild creature could withstand such a drain upon it. The lapwing has been called of all birds the farmer's best friend.

"These few examples hint at the practical worth of birds. They are the appointed agents for certain branches of agriculture. As such they are of paramount importance in the history of a country—indeed, of the whole world. I have chosen these species as illustrations of utility because, for the purposes I have named, heavy toll has been levied on them, as well as on hundreds of others, in almost every country in Europe.

"Time will not permit my even enumerating the laws which have been enacted in most civilised countries for the protection of birds—laws which, unfortunately, are nowhere enforced as they should be, owing to the laxity of public opinion with regard to them. I trouble you by alluding to this part of the subject because women so often say to me, 'What is the use of talking to us against wearing feathers; why don't you get laws made to protect the birds?' So I want to show that the legal aspect of the question is being constantly considered; but, unhappily, the law cannot do much, and without public opinion in its favour it can do absolutely nothing—at least with the English-speaking race!

"International conferences have been held, and such steps as these are necessary. This year an important International Conference with regard to the preservation of Animal and Bird Life in East Africa takes place in London, and in 1900 an International Conference is to be held in Paris, again especially to consider the protection of migratory species. The wholesale destruction of swallows which has taken place during the last few years, and the horrors connected with the importation of live quails from Egypt and Italy, call for the enactment of some stringent regulations to be observed by all nations.

"I must now dwell more particularly on what has been called 'Murderous Millinery,' and I think you will allow that the term is a just one when I tell you that upwards of thirty-five millions of birds are annually imported into this country for

trimmings and decorations alone. The majority of these are killed during the breeding season, as it is then that the plumage is finest and of the highest commercial value. To kill during the breeding season means the death by starvation of helpless nestlings, so that here the question of cruelty as well as that of the speedy extermination of species comes in. Lord Lilford once said to me, in referring to a Spanish proverb, Surely the cause of the birds must be safe—'entre les mains blanches.' Alas! that it should not be so, and that we have to confess that women are most difficult to convince of the evil being wrought in their name and for them.

"There is one kind of feather ornament which is quite innocent. The beautiful feathers of the ostrich may be obtained without any suffering or distress to the bird, and without any destruction of life. On properly conducted ostrich farms at the Cape, and in other parts of the world, every care is taken of the birds; food and all other comforts being provided for them. Just before the moult the birds are collected into a large enclosure: one by one they are driven down a narrow passage, at the end of which they are deftly seized and held by two men, while a third quickly clips off the feathers, many of the ripe ones coming out at a touch. The process is over in a few minutes, and the bird—none the worse—is again free to roam at will.

"It is a relief to know that we may wear our ostrich feathers, and use our down pillows and quilts with easy consciences; but how can tender-hearted women wear, as ornament, anything that is obtainable only at the cost of unspeakable suffering, and of the wholesale slaughter of our pretty feathered friends; and how can I possibly convey to you the cost at which the fashion of feathers and wings has been and is being complied with?

"Hear what Mr. Howard Saunders, an eminently scientific man, says of gulls and seabirds:

"'These birds have been slaughtered under circumstances of horrible barbarity, to provide adornments for ladies' hats. I have watched, day after day, a flotilla of boats procuring plumes for the market; one gang of men shooting, and changing their guns when too hot; another set picking up the birds, and often cutting their wings off and flinging their victims into the sea, to struggle with feet and head until death slowly came to their relief; and I have seen the cliffs absolutely 'spotted' with the fledglings which have died of starvation, owing to the destruction of their parents. And it may be accounted unto me for righteousness that, in my indignation, I hove down rocks whenever such an act would interfere with the shooters.'

"Mr. Thomas Southwell, a well-known ornithologist, said last year, when writing of those lovely and graceful creatures, the terns, or sea swallows:

"'It is these delicate and beautiful birds which are most in request—of course in their breeding plumage—to supply the 'smashed birds' and groups of wings which, notwithstanding

twenty years' exposure of the cruelty of the practice, still, I regret to see, are more than ever in fashion as trimmings for ladies' hats. It is quite time to speak out, and fix the blame where it is most assuredly due. After all that has been said and written, it is impossible for women to plead ignorance, and the only legitimate conclusion to which we can arrive is that they deliberately sacrifice all their finer feelings at the shrine of fashion, and care not what amount of suffering and wrong is inflicted provided their vanity is gratified.'

"Love of dress and fashion is leading to the extinction, complete or partial, of all the most ornamental birds in every part of the world.

"The most notorious of all feather decorations is the 'osprey' worn on hats and bonnets. The millinery term 'osprey' must not be confused with the osprey of ornithologists, which is a sea eagle and has nothing whatever to do with the 'ospreys' seen in women's headgear, the word in this case being merely a corruption of 'a spray.' The so-called osprey of millinery is obtained from a heron or egret. There are about sixty kinds of herons throughout the world, all long-necked, long-legged, and long-winged birds; but it is the great white heron and the little egret which are especially persecuted for fashion's sake, because of the set of slender feathers which in the breeding season grow on the egret's back, and droop over the sides and tail of the bird: these nuptial ornaments are worn by both male and female birds.

"I should like to direct attention to the story as told by Mr. Gilbert Pearson, at the World's Congress on Ornithology, held at Chicago in 1897:—

"'I visited a large colony of herons on Horse Hummock (Central Florida), on April 27, 1888. Several hundred pairs were nesting there at the time. . . . While quite close to the breeding grounds I climbed a tall gum tree and was able, unobserved by the birds, to survey the scene at leisure. . . . Three years later I again visited the heronry of Horse Hummock, found the old gum, and climbed among its branches, but the scene had changed. Not a heron was visible. The call had come from northern cities for greater quantities of heron plumes for millinery. The plume hunter had discovered the colony, and a few shattered nests were all that was left to tell of the once populous colony. The few surviving tenants, if there were any, had fled in terror to the recesses of wilder swamps. Wearily I descended from the tree, to find among the leaves and mould the crumbling bones of the slaughtered birds.

"'A few miles north of Waldo, in the flat pine region, our party came one day upon a little swamp where we had been told that herons bred in numbers. Upon approaching the place the screams of young birds reached our ears. The cause of this soon became apparent by the buzzing of green flies and the heaps of dead herons festering in the sun, with the back of

each bird raw and bleeding. The smouldering embers of a camp fire bore witness of the recent presence of the plume hunter. Under a bunch of grass a dead heron was discovered, from whose back the plumes had been torn. The ground was still moist with its blood, showing that death had not long before taken place. The dirt had been beaten smooth with its wings, its neck was arched, the feathers on its head were raised and its bill was buried in the blood-clotted feathers of its breast, where a gaping wound showed that the leaden missile had struck. It was an awful picture of pain. Sorely wounded this heron had crawled away, and after enduring hours of agony had died the victim of a foolish passion. Young herons had been left by scores in the nests to perish from exposure and starvation. These little sufferers, too weak to rise, reached their heads over the nest and faintly called for the food which the dead mothers could never bring.

"'It is bad to see such sights from any cause, but when all this is done merely to gratify fashionable women's vanity, it becomes still worse. These are but *instances* of the destruction of bird life. Unless something is done to stop this awful slaughter it is only a question of a few years before the herons, not only of Florida, but of the whole world, will be exterminated.

"'Women who know of the cruelty necessary to procure the feathers they wear on their hats should stop wearing them, and exert their influence to make other women see how cruel and wicked they are. May God's blessing rest with all who strive against this sin. Man is either the greatest protector or the greatest destroyer of birds.'

"The excuse, often now given, that the plumes sold are artificial, is in many cases, as was shown by Sir William Flower, a monstrous fiction. Even by wearing plumes that are genuinely artificial a bad example is set, and an evil fashion kept in vogue.

"People also tell you that in some places the shed egret plumes are to be picked up in handfuls when the birds are moulting. This may be so, but that is not how the hunters and dealers obtain their wares, for they are content with nothing less than the plumes in the *best* condition, which is at the actual breeding season.

"It is not without significance that making known these facts has recently resulted in an order being issued from the War Office commanding the disuse of the egret plumes hitherto worn by officers of certain British regiments.

"But it is not only the beautiful white egret. There are scores and hundreds of the loveliest known species that are in the same case; for a nuptial dress is well nigh universal in this class of creature.

"During the last few years the birds of paradise have been pursued so relentlessly that there is a great fear of their total

extermination. The bird of paradise does not reach maturity until he is four or five years old, which means that the supply is comparatively very limited. It is only the male bird who at the breeding season produces those long soft feathers known as 'paradise plumes'; but the skins and heads of the females are used for trimmings also, and last year the number of female birds—mothers torn from their young—far out-numbered the males which were imported into this country. Quite apart from the cruelty exercised by the hunters, I am sure none of us could wish to be parties to the destruction of this beautiful bird, which is found nowhere outside of the Malayan and New Guinea region, and has not its peer in any other country, and which is one of the glories of creation.

"I wish I had time to enumerate and describe the myriad brilliant birds which the imperious demands of women are causing to vanish:—humming birds, trogons, kingfishers, parrots, tanagers, orioles, Impeyan pheasants, Victoria crowned pigeons, grebes, and many others. Even if we never have an opportunity of seeing these wonderful creatures, that is no reason why we should not take a deep interest in them and delight to hear and think of them, for are we not citizens of the world and should we not, therefore, every one of us, feel the dignity and pride of possession in *all* that this marvellous world contains, and feel it our duty to do what we can to preserve these wonders of nature, which man can and does so easily and ruthlessly destroy, but which he can never again create? Says Mr. W. H. Hudson, 'What an impoverished nature and earth future generations will inherit from us! God's footstool, yes; but with all the shining golden threads picked out of its embroidery. Some knowledge will survive among our remote descendants of the wonderful and brilliant forms of bird life that are now passing away, and with it some knowledge of how it was destroyed in the space of a few decades for the gratification of a detestable vanity. They will, I fancy, think less kindly of their cultured Ruskin-reading nineteenth century ancestors, than of those very much more distant progenitors who had some shocking customs, but who spoilt nothing.'

"This picture is no exaggeration. I have mentioned figures to show the vast quantities of ornamental plumaged birds slaughtered annually. The destruction is almost incredible; but of course when the old are killed and the young are left to die of starvation, extinction is only a matter of time.

"Besides beautiful tropical creatures, birds familiar to us all are killed in countless numbers. Fancy killing the robin redbreast to trim a ball dress! Fancy permitting the lovely swallows to be destroyed that their wings may trim a woman's hat!

"Would that every woman would take to heart Browning's incisive reproach—

"'She: My modiste keeps on the alert,
Owls, hawks, jays, swallows, most approve.
He: *You*—clothed with murder of His best
Of harmless beings!'

For twenty years these stories have been told and retold, but we appear to preach to deaf ears, and it is the good women who are the greatest hindrances. If an out-and-out worldling declares by her words and her conduct that she will wear feathers procured only at the cost of great suffering, and that she cares nothing for the extermination of lovely species of useful beings, we fear that her heart and conscience must be non-existent; but when good women, who we *know* are in earnest in their desire that right should triumph over wrong, refuse to help our righteous cause, then we feel in despair, and ready to cry, 'Let the birds perish! Let them perish! The sooner their sufferings are ended the better, and then, when it is too late, man (and woman) will discover what a poor, worthless, uninhabitable place this world is without the birds.'

"The statements I have made are not sensational stories, made up by sentimental women or ignorant men. Scientific men, men who would not swerve a hair's breadth from the truth to make the story sound pathetic, and who are down upon any exaggeration remorselessly, are those who have used the strongest language in condemning the wickedness, cruelty, and waste of the fashion of bird wearing.

"I have quoted poets and men of science. In conclusion, may I call attention to a great artist's appeal. At the New Gallery, in Regent Street, there is now to be seen a picture by Mr. G. F. Watts, painted for the express purpose of pleading the cause of the birds. It is called 'A Dedication to all who love beauty and mourn over the senseless and cruel destruction of bird life and beauty.' It represents an angel with bowed head and despairing figure, bending over a marble tomb covered with birds' wings, while a spirit of evil (Fashion) grins below. While he was painting it Mr. Watts called it his 'Shuddering Angel'; and as we look at it we are reminded of the following lines, which appeared in *Punch*:—

"'Feathers deck the hat and bonnet;
Though the plumage seemeth fair,
Angels as they look upon it
See but slaughter in the air.
Many a fashion gives employment
Unto thousands needing bread;
This to add to your enjoyment,
Means the dying and the dead.

"'Wear the hat without the feather,
All ye women, kind and true;
Birds enjoy the summer weather
And the sea as much as you.
There's the riband, silk, or jewel;
Fashion's whims are oft absurd,
This is execrably cruel,
Leave his feathers to the bird.'"

Sir H. Maxwell, M.P., said that he would tell them his honest opinions, though he was aware that they might not be reconcileable with the views of all present. If they were to regard the matter in a practical and logical light, it must be conceded that wild animals had no rights except those which had been conferred on them by legislation in various countries. Where would they find their rights in nature? They heard a great deal of the busy work of the little birds in killing the insects, but who was there to say a word for the insects? Were they not also wild animals? Were the tender mercies of the meeting to be limited to vertebrates? Let them look at this in a reasonable sense. Sentiment had its due part to play, but it must be their servant, and not their mistress. It was not much more than fifty years since the initiation of humane legislation in Parliament. In 1825 a Bill for abolishing the brutal practice of bear-baiting was rejected by the House of Commons, but it was passed not many years afterwards. Then a Bill was brought in to prevent dogs from being used as beasts of draught. It was dictated by the most admirable motives, but he believed that it was mistaken. Those who had seen dogs working cheerfully and willingly in many Continental towns would have observed that, unlike horses or mules, they were able to lie down when the vehicle was standing still. It was impossible to beat or abuse them in the same way as horses, for a horse suffered mutely and redoubled his efforts, while a dog would lie down and yell, and get under the cart if he could. It did not pay to ill-use a dog in harness. He was not advocating the restoration of the system, because we were well able to get on without it in this country; but the Act, framed under mistaken sentiment, had done nothing more than confer on dogs a statutory right to idleness, a very questionable boon, as those who had tried it could testify. It must be admitted that sentiment was a somewhat capricious power. They heard a great deal of the ruthless destruction of wild birds, but seldom anything about the inhumanity of condemning a bird, the very type of freedom, to life-long captivity. Women were more abundantly gifted with the quality of mercy than men, but he feared that they were the best and most consistent customers of the bird dealers. He did not like to reflect on the misery of caged birds, and was quite sure that those who kept them were unaware of it, because, unhappily for themselves, most birds had a cheerful, contented expression of countenance and lively movements, which disguised what he believed to be their real sentiments. The mortality of foreign birds imported annually to keep up the supply would pass all belief if reduced to statistics. If there was any right that could be said to be inherent in any animals it was that of the migration of birds, and they had only to imagine the strong impulse and suffering that those kept in wire cages must undergo. Women were the real instructors in works of mercy. There was only one place where men could

learn mercy, and that was at their mothers' knees, and he trusted that among all the new provinces that they were entering with a right that he did not question, they would not forget that province which had been specially theirs from time immemorial—the homes and the hearts of men.

Sir E. Grey, M.P., agreed that sentiment was an excellent power when controlled and properly directed, but in all movements of that kind the greatest danger lay in the exaggeration of sentiment. The moment it departed from fact it raised up a great number of unjustifiable enemies. He asked them to look at this question from the point of view of common sense and expediency. They lived in a world where there was a great deal to admire and interest them, and they found that some of its best objects were in danger of extinction. If that happened, the world would become a poorer place, and it was their duty to endeavour to preserve all objects of interest for succeeding generations. Wild life was in danger of extinction. No doubt private collectors had done something to impair the number of rare and valuable species, and he thought that the provision of good public museums should be encouraged rather than private collections. But no amount of scientific research could be accused of the wholesale slaughter caused by the trade in birds and feathers for ornament. No one wished to oppose ornament simply because it was ornament, and in the case of the ostrich feather it had undoubtedly led to the preservation of the bird; but they objected to wholesale slaughter under the most inhuman conditions. They should try to bring influence to bear on public discrimination to prevent this trade in feathers. He did not attribute the evil to deliberate vice, but to simple thoughtlessness and indifference; and the remedy was to be found in getting people to take more interest in bird life and wild life round about their own homes. In considering this matter they must remember that now, in a stronger sense than ever, the great civilised nations were the trustees of the whole world.

The Protection of Large Birds.—"Verax" writes:—"May I be allowed through your columns to call attention to the ravages now committed amongst fruit by small birds. No one can be fonder of birds than I am. They are of great service in many ways to the fruit grower, and I have never countenanced shooting or destroying them in any way. At the same time I cannot shut my eyes to the fact that their numbers are in some districts excessive, and that the damage done by them to fruit buds is becoming a serious matter. For the last two years there has been hardly a plum or pear in my orchard or garden, the buds having been ruthlessly stripped from the trees by the birds during the winter months. As to gooseberries, I find it impossible to grow them except under wire netting, and this last winter the birds even destroyed large quantities of the apple

buds. What *kinds* of small birds are responsible for the damage I do not know: I only know that the damage is *done*, and done so effectually that in many cases the wood is killed where the buds are pecked out. Now what, I ask, is the remedy for this state of things? For my part I can see but *one*, viz., the protection of those large birds that are the natural enemies of the small ones. Let a Bill be passed by Parliament, enjoining the protection and encouragement of sparrow-hawks and all such predatory birds, especially forbidding their destruction by game-keepers, and I think the evil would soon be moderated. The balance of Nature would be restored, the small birds would, by the most merciful method possible, be reduced to their proper numbers, and we should no longer have to lament over devastated orchards and ruined fruit plantations."

OBSERVATIONS FOR YOUNG BOTANISTS.

VIII.—Bracts and Inflorescences.

THE word "Inflorescence" stands for the way flowers are grouped together to make a single bunch, so to say; but when there is only one flower, as of a tulip, then this itself constitutes the inflorescence.

As leaf-buds, which develop into leafy branches, arise from the axils of leaves; so, as a rule, a flower-bud arises from the axil of a bract.

Since the parts of a flower are "homologous" to, *i.e.*, of the same nature as, leaves, though assuming quite different forms and functions, so bracts are only arrested leaves, but often altered in character.

Bracts.—The first observation to be made is that all sorts of transitions can be found between a true leaf and a true bract. Let us take a few examples. The hellebores furnish excellent illustrations. The leaf is peculiar, having a much divided blade on the end of a long petiole. Now, if the stem be examined from below up to the flowers, between them and the leaves, will be found flattened petioles bearing very short segments to the much reduced blades. Higher up the petioles become broader and shorter, and finally the leaf segments are totally arrested: all that remains is an oval pointed bract, which is then seen to be really a leaf-stalk. If a buttercup stem be examined, it will be at once seen that the petiole is now wanting, the bract being made of the divided blade, reduced to a very few segments only.

In some plants there is no difference between a leaf and a bract except in size, so that it is difficult to say which is which, as in viper's bugloss (*Echium vulgare*) and in willow-herbs. The interpretation of the origin of bracts appears to be that when

the period of vegetative growth is declining, and that of flowering coming on, the leaves gradually cease to be formed, and are then reduced to bracts by being arrested in growth. In addition to this, bracts may now partake somewhat of the nature of corollas and become white or brightly coloured, so that they can assist in rendering the flower attractive to insects, which come for honey or pollen, and so "pollinate" the flower. As an example may be mentioned the well known *Poinsettia*, used as a decorative plant in winter, with its brilliantly scarlet leaf-like bracts; and some salvias have not only scarlet corollas, but scarlet calyx and bracts as well.

In some instances the bracts may surround a dense cluster of flowers, as in the *Compositæ*. They are then collectively called an "involucre," as in the daisy and dandelion. In these two flowers the involucres are green; but in some they are white, yellow, red, &c., and can easily be taken for a corolla, as in the so-called "everlastings."

Again in some cases they imitate a flower more exactly, as in certain species of cornel (*Cornus*), the inflorescence of which consists of a dense mass of very insignificant looking flowers, with four large white bracts, very suggestive of a white-flowered clematis.

Another shrub-like plant, called *Darwinia tulipifera*, belonging to the myrtle family, bears inflorescences which, to the uninitiated, look like coloured tulips hanging down all over the bush. These are composed of brightly coloured bracts, within which are some dozen of very small flowers.

Another result of a change of nature from leaves to bracts, especially on poor soils and in a dry atmosphere, is to reduce the bracts almost entirely to spines. Thus the star-thistle (*Centaurea Calcitrapa*) has the bracts of the involucre terminating in long sharp points. It has got its specific name from the resemblance to a "caltrop," an iron ball with four spikes used for impeding cavalry. This plant is the "thistle" of the desert mentioned in Scripture. It is rare in England.

A curious form of bract is seen in the so-called "spathe" of our common lords-and-ladies (*Arum maculatum*). The cultivated "arum-lily" has a white one, though in other species it is yellow, scarlet, &c.

Inflorescences.—The simplest kind of inflorescence is where the flowering shoot is terminated by a single flower, as in the tulip and buttercup. If the same stem bear any more, the flowers must arise from points *below* the first. All such inflorescences are said to be "definite;" but if the shoot continue to elongate and the flowers arise one after another in an ascending series, as in a wallflower, fox-glove, and lily-of-the-valley, no flower ever terminating the stem, then such is called an "indefinite" inflorescence.

A stem bearing a terminal flower, or a bunch of flowers as in the horse-chesnut, of course, cannot lengthen; but it often

appears to do so; because when the leaf-bud, below the inflorescence, begins to elongate, it pushes the terminal flower-stalk to one side, and finally replaces it; so that if a bough of a horse-chesnut be carefully examined, successive years' growths can easily be made out lying in one continuous straight line, each "joint," having borne a terminal bunch of flowers in the spring.

The same thing occurs in the vine, both as regards flowering branches and tendrils, for these are really terminal; but the bud in the axil of the leaf below them grows out into the same straight line as the main stem; so that the flowering branch or tendril appears to spring from the side and thus assumes a position opposite to the leaf.

The vine affords a good illustration of a change of use; for a flowering branch or inflorescence is homologous with a tendril. The student should search for intermediate conditions, in which tendrils will be found bearing a few flower-buds, and in proportion to the number of buds thus formed does the tendril begin to lose its sensitiveness for climbing purposes, as described in the case of the pea.

The tendrils of the Virginia creeper (*Ampelopsis hederacea*) are also really flowering branches, converted to a different use; but in this case they turn towards the darker side, as they climb walls. The student should compare them with those of another species from Japan (*A. Veitchii*), which clings more closely and does not produce the long pendulous streamers of the American sort. In this latter kind the tendrils end in little hooks which catch into depressions of a rough surface. The contact then causes them to swell into adhesive pads by which the tendril is fixed to the wall.

In the case of *A. Veitchii* the pads are partially developed *before contact*, but are only completed after pressing against the surface of the support.

Another curious modification and use of an inflorescence is seen in a fig. In a plant of the same family to which the fig belongs, called *Dorstenia*, the inflorescence consists of a flattened out extremity of the stalk, something like a dish. On the surface are numerous minute flowers. If the edges of the dish be supposed to be caught up to form a bag, with the hole at the top, we get the fig, which now carries all its flowers thickly distributed all over the inner surface. In this case, therefore, the whole inflorescence ultimately becomes the succulent fruit we eat; the seed-like bodies in a fig being thus really the fruits of the little florets within the bag.

In the mulberry, the male and female inflorescences are distinct and form separate "catkins." The female consists of a dense mass of flowers, each having a four-sepaled calyx and pistil. When it becomes a fruit the sepals swell and turn purple, while the pistil forms a dry seed-like body in the middle; so that, unlike the fig, the inflorescence forms a succulent fruit composed of calyces only.

THE NEW FOREST AS A SANCTUARY.

The desire expressed by Mr. Rawnsley in the April number of Nature Notes is one which I hear so constantly echoed by the cultivated people I meet and talk with on the subject, that it seems strange that so little progress is made in that direction. We are told that if the people desire it enough the sanctuary will be accorded, so that it appears that the authorities only wait for a sufficiently formidable representation on the matter. As the Selborne Society has taken the most conspicuous interest in the subject, I suggest that every branch of the Society initiate simultaneously a memorial or petition to the Commissioner of Woods and Forests, praying him to take the necessary steps to establish the legal immunity of certain portions of the New Forest from invasions of any micidal character, either with reference to birds, flowers, quadrupeds or reptiles of a harmless character, including prohibition of taking nests or uprooting plants, this immunity to apply to such woodland portions of the Forest, and the open country involved, as can be set apart by regulation, and efficiently policed to secure it from invasion. The remaining sections of the Forest may be left for future consideration, when the effect of the partial sanctuary shall be seen, leaving present rights and privileges undisturbed, and those of the authorities unprejudiced. It is evidently useless for the friends of the animals to ask the immunity of the entire region, and it would be impossible to secure the efficient protection of it, but a few thousand acres chosen in a section where the nature of the land ensures a feeding ground for all the natural inhabitants, might with no injury to any vested rights be protected without raising any rational opposition. Five thousand acres "in a ring fence" with a couple of efficient custodians will serve all the purposes of a model forest, and the result would show what should be done in regard to the rest, if indeed more were demanded. The chief objection to so small an enclosure is that it would be so crowded by visitors that the necessary seclusion for nesting and breeding would not be preserved; but this difficulty would gradually disappear, for the familiarisation of the wild creatures, when they have come to recognise the immunity from disturbance of any kind thus given them, proceeds so rapidly as to surprise anyone who has not tried the experiment.

What ought to be finally aimed at as a definite disposition is a law for all the land held by the Crown as a public possession, forbidding the killing of any creature on it except such as may be found too destructive of species more desirable, and which shall be scheduled to that end, and perhaps permitting the killing of game on such portions as are not declared as sanctuaries. This will leave private estates free from other restrictions than those which the proprietors decide to be

requisite and accordant with their rights, subject to a most desirable law for the prevention of methods of killing which involve needless pain or cruelty, putting wild animals under the protection of the law which now protects the domesticated. The absolute protection of song-birds and those which, without being noxious, are ornamental, at all seasons and everywhere in the kingdom, is a measure in the interest of society at large, and should not depend on a sanctuary or the will of the owners of the land, and is not a matter which should be complicated by any connection with the subject of this note. The limitation of any law regarding the protection of animal life to the public domain ought to secure the neutrality, if not the adhesion, of estate owners and make the passage of the law easy. But to get anything of what we desire it is necessary that the societies act together and at once.

The law establishing the sanctuary should also forbid the gathering of any product of the land which constitutes the food of the animals, such as the pine cones, which are the chief food of the squirrels, or fruits of any kind, nuts, &c., &c. The general question of the extension of the law for the prevention of cruelty to animals to wild animals is a separate one, which ought to stand on its own merits and it comes under the care of the R.S.P.C., whose Hon. Secretary has shown his sense of its importance ; so that the question of sanctuary, as one which comes peculiarly within the scope of the Selborne Society, should not be confounded with other questions in our action. "Who embraces too much holds nothing."

W. J. Stillman.

Condercum, W. Bournemouth.

NATURAL HISTORY NOTES AND QUERIES.

Strange Foster-parents.—The Berlin correspondent of the *Standard* reports a curious case of adoption by a pair of cats, a tortoiseshell and a white one, owned by a family in Berlin. They had been brought up by the children to be so tame as to live on the most friendly terms with the dog, and the fowls, and other pets. Nevertheless, much surprise was caused by the news that the white cat had adopted seven chickens which had been deserted by their mother. She went to the basket where they lay, covered them over, and kept them warm under her soft fur. The tortoiseshell cat, too, after watching the white one for some time, ended by also sitting in the basket and helping to keep the chickens warm. The action of the white cat can be explained to a certain degree by the fact that she had had three kittens a fortnight before, which were taken away from her.

Conversely, in June, a local newspaper mentions that at Hawes, in Wensleydale, a hen has voluntarily taken charge of a family of kittens, and covers them during the absence of their mother. When the cat comes to provide her young with their natural nourishment, the hen steps aside for a while, but returns to her place again whenever the cat leaves them.

Mole.—A cat, belonging to a neighbour, having seized a young mole, the creature bit her through the upper lip, and hung on, in spite of the cat's frantic

efforts to rid herself of the unwelcome parasite. When separated, the mole appeared little the worse for the encounter, and was liberated.

Nascott, June 12, 1899. GEORGE ROOPER.

Field Mice and Eggs.—I have seen a box in which a great tit laid nine eggs. These all disappeared. As long-tailed field mice have been noticed to ascend the tree in which the box was placed, by means of the ivy round the trunk, it looks as if they were the robbers. Can these mice have removed the eggs from such a position without a trace being left? And are they known to be robbers of nests? A second nest, which looks like a sparrow's, has been commenced on the top of the tits' nest, but has been forsaken.

Market Weston, Thetford, June, 1899. EDMUND THOS. DAUBENY.

Canaries.—Mrs. Downer, of the High Street, Watford, has a canary sitting on seven eggs. Is not this very unusual?

GEORGE ROOPER.

Dropped Starlings' Eggs. — I have now and then found freshly laid eggs of some of our common birds on the ground, under circumstances that made me think they had been laid away from the nest. Starlings build in every suitable spot on my house, and their eggs are sometimes picked up on my lawn; one not long ago being brought to me by my daughter for identification, that was quite fresh. Circumstances may occur among birds as among other animals, to cause a sudden birth, such as fright from the noise of a gun for instance. Many years ago one of my brothers shot at, but did not kill, a heron in the middle of a field: on going to the spot he found it had laid an egg.

Market Weston, Thetford, July, 1899. EDMUND THOS. DAUBENY.

Blackbird Drinking Milk.—My garden is a sanctuary for birds, and the young birds have no fear of me, but look upon me as a foster-mother, whose duty it is to feed them; to-day I saw a young blackbird drinking the milk in a saucer which had been put down for the cat. It seemed quite to his taste, as he returned to the saucer of milk again and again.

Swifts, Martins, Sparrows. — A friend near here has many nests of martins under the broad eaves of his house, and their numbers are much increased from the protection he affords them. There were two martins' nests touching each other, for which some swifts seemed to have a curious longing, coming there every morning and evening for days together. Thinking that the swifts had laid in one of the nests he examined their contents. In one, the martins had laid five eggs, and in his examination he broke away a part of the nest. This the martins repaired the next day; and they are now sitting. The other nest, which was tenanted by sparrows, he destroyed, and the spot was immediately built upon by a pair of martins. Soon after the nest appropriated by the sparrows was destroyed, the swifts quitted the spot. Now, swifts are known to be partially parasitic, and often rear their young in sparrows' nests. It seems to me that in this case the swifts meditated seizing the martins' nest that was tenanted by the sparrows, but desisted from their intentions when they found it was rebuilt and occupied by their cousins the martins.

Market Weston, Thetford, June, 1899. EDMUND THOS. DAUBENY.

Nuthatches. — I have just seen some remarkable work done by nuthatches. In a horse-chestnut tree near here there is a decayed part where a branch had broken off close to the stem, and was hollowed out by tits last winter when searching for insects. This spot in the tree is as large as a man's hand with the fingers closed together, but not clenched. A pair of nuthatches have plastered this up, leaving a small round hole for entrance to their nest. This is the largest piece of plastering by nuthatches I have seen, and is so well done as to look very like the wood of the tree itself.

I have also been shown the contents of a box in which a pair of these birds have just reared a brood. They were considerably more than could be carried in my two open hands. At the entrance to the nest there was a piece of mud two inches

long, an inch high, and an inch thick, at the edge of which there was a semicircular hole. At first sight this looked like a bit of brick, so well was the mud worked together. The materials of the nest consisted of thin pieces of bark from the Scotch fir; there was also a considerable number of sticks four inches long and thicker than a pencil; and besides these, some flat pieces of wood, as broad as one's finger, and of the same length as the sticks. All these had been picked up at the edge of the stream close by, for they were light and dry after being subjected to immersion, and had been dragged through a hole to the nest not much bigger than a penny piece.

Market Weston, Thetford. EDMUND THOS. DAUBENY.

The Cuckoo's Note.—I believe some correspondence appeared recently regarding one of the cuckoo's notes; I have not, however, been able to trace it. The ordinary note of the cuckoo is, of course, known to thousands from childhood, but the one in question is, I fancy, but seldom recognised as his, save by experts and others who endeavour to scrape acquaintance with the feathered tribe. My wanderings in the country are mostly confined to the evening, and as far as my experience goes this particular note is the exception. Mr. Hett, in his Dictionary, gives it the pronunciation of "Cule, cule (a bubbling cry, most difficult to represent by letters)," the impression, however, created in my mind is that of a quick, zigzag, bubbling line of sound, which I am unable to syllable in any way. Is it an alarm note, or what? Will you permit me, while on the subject, to express my regret that so little attention is given to the wild birds in the Magazine; the sound of their notes will often convey a fairly clear syllable, and the birds themselves can frequently be stalked with a glass and identified by their plumage, when, as often happens, the note applies to more than one. Last year I was puzzled by a note that is common to two or three birds, until a week or so ago I managed to fix the bird with the glass as I wandered through the wood and identified him as a nuthatch. The subject is so interesting and fascinating that it well deserves a space in the Magazine of a Society linked with the memory and associations of Gilbert White.

Stoke Newington, N., June 20, 1899. J. G. BRADFORD.

Robin and Blackbird.—It may perhaps interest your readers to hear that the robin, of which a description was given in the May number of NATURE NOTES, has once more re-appeared in the garden of Eastgate, Chichester. But domestic cares and joys, the undoubted cause of her prolonged absence, have alas! succeeded in destroying the pretty attitude of confiding trust with which she formerly regarded her human friends, and have changed her, for the present at least, into a very wild and unapproachable little bird.

A word more about two other *habitués* of this garden and I have done. A pair of blackbirds have for three successive years contented themselves by simply refurnishing their old and original nest in the heart of an evergreen bush, where their sixth family, the second this spring, has just been reared. I should be glad to know if this laudable regard to the economy of time and labour is a usual feature amongst the blackbird tribe.

28, *St. Aubyn's, Hove.* R. V. BALLARD.

The Wryneck.—It will interest your readers to know that on Tuesday, June 13, I had a very good view of the wryneck (*Iynx torquilla*) in Pittville Gardens, Cheltenham. The bird flew to the trunk of an elm within a few feet of me, and about ten feet from the ground, and most kindly remained there motionless for five or six seconds while I gazed. A wryneck (probably the same bird) was seen the following day in the same gardens by another observer, who informed me that he had seen about half-a-dozen of these birds in this neighbourhood during the present season.

2, *Blenheim Terrace, Cheltenham, July* 3. CONWAY DIGHTON.

The Bramble Finch.—A pair of these birds built this year and brought off their brood safely in the churchyard of Maisemore, near Gloucester. Only the vicar's daughter knew about the nest and she kept the silence which is golden.

2, *Blenheim Terrace, Cheltenham, July* 3. CONWAY DIGHTON.

Blackbird Nesting Twice in Same Nest.—Some years ago a pair of blackbirds built their nest in the ivy on a fence in my garden. They did not seem to mind my watching them, and in due time four nice young blackbirds left the nest. Greatly to my surprise the mother bird came back again in a very short time and laid four more eggs. She was so tame that I used to go and talk to her as she was sitting on her eggs. When the young were hatched and ready to fly, one came out of the nest in the path just behind a fox terrier : I was so afraid the dog would get it that I picked it up and put it back in the nest. But I suppose I alarmed the others for out came two more. I tried to put them back but the parents made such a raid and flew about so that I left them. I was very sorry, for I thought I should see no more of my blackbirds, but I did ; the hen bird built a second nest for a third brood, quite close to a window. I knew her again by her very black head and her tameness. The window (a French one) was always open and the piano, which was near, was often played upon. At such times Mrs. Blackbird would sit on a rose-tree close to her nest and make such a noise. Whether she liked music or not we could never find out. She laid four eggs and reared her young safely. After that I lost sight of her.

Hatfield, Herts. LUCY ROWLATT.

Cuckoo-Spit.—There is a common belief among gamekeepers round here that cuckoo-spit, or frog-hoppers, are destructive to the lives of young partridges and pheasants. To these insects in the larvæ state, surrounded by the well-known mass of froth, they ascribe much of the diseases they have to contend with. They even say "Gapes" come from eating them ! which is of course absurd. I should imagine that the cuckoo-spit insect was a toothsome and harmless morsel to young birds.

June, 1899. EDMUND THOS. DAUBENY.

White Spider.—Will somebody kindly inform me whether a white spider is a great rarity ? I have this morning found one in the petals of a white pink. He was lunching off a bee. He is not perfectly white but has the faintest tinge of green so that he matches the bases of the petals, and he has four gold spots on his very fat body. I have never heard of such a creature before and should like to know whether there are ever albino insects.

Kent, June 27, 1899. E. K. HITCHCOCK.

SELBORNE SOCIETY NOTICES.

Death of Sir W. Flower.—At the Council Meeting on July 4, it was resolved : "That the Council of the Selborne Society wishes to express its deep sense of the loss sustained by the Society and by the cause of humanitarianism by the death of its Vice-President, Sir William Flower."

Donations.—The Council beg to acknowledge the receipt of £5 from the Ealing Branch, and £1 from William White, Esq., F.S.A.

Council Meetings.—The next meetings of the Council will be on August 1 and 15.

Field Club Rambles :—

August 5.—Saturday before Bank Holiday. No ramble.

August 12.—Roydon Village and Nether Hall. Meet at Rye House Station, 2.50. (Liverpool Street, 2.15; Clapton 1 p.m.) Day return ticket 1s. 6d. Thence by fields to Roydon, where tea will be taken, and afterwards to Nether Hall and back to Rye House by the banks of Stort and Lea. Train home, 8.45. Guide, Mr. W. B. Gerish.

August 19.—Cheam, Nonsuch, Morden, and Carshalton. Take single tickets to Cheam. Victoria (L.B. & S.C.R.), 2.14; London Bridge, 2.38; West Croydon, 3. Guide, Mr. E. A. Martin, F.G.S.

August 26.—Leave Byfleet Station on arrival of trains from Waterloo (main line) 2.29; Surbiton, 2.52 ; Weybridge, 3.7. Ramble by lanes and fields to Wisley Church. Tea at Anchor Inn. Return from Byfleet 8.7 or 9.21. Guide, Dr. Willson. Permission has been granted for a visit to the famous garden of G. F. Wilson, Esq., at Wisley.

September 2.—Leave Leatherhead Station (S.W.R.) at 3.30 for Fetcham Mill, Norbury Park, and Mickleham Valley. Distance 5 miles. Trains leave London Bridge (L.B.S.C.R.) 2.0 and Waterloo (S.W.R.) at 2.40. Cheap return tickets, 1s. 9d. Guide, Mr. A. B. Wilkinson.

NEWS FROM THE BRANCHES.

Clapton.—On June 17, at the invitation of Mr. and Mrs. W. B. Gerish, the members of this branch visited Haileybury College (by the kind permission of the Hon. and Rev. Ed. Lyttleton, M.A.), and after inspecting the various departments returned by a pleasant walk to Ivy Lodge, Hoddesdon, where the host and hostess very kindly entertained the party at tea. After tea Mr. Gerish read a very interesting paper upon Haileybury and its College.

ANSWERS TO CORRESPONDENTS.

Rev. A. H. Courthope.—*Vicia gemella*, Crantz., the Smooth Tare.

E. M. Beechey.—The pupa (chrysalis) of *Abraxas grossulariata*, the Magpie or Currant Moth.

H. Peyton.—1. *Plagiochila asplenioides*, Lindenb. 2. *Mnium undulatum*, L. 3. *Thamnium alopecurum*, Br. et Sch. 4. *Scapania nemorosa*, Dumort. 5. *Agrimonia Eupatoria*, L.

W. A. Dutt.—1. *Phalaris paradoxa*, L., a Mediterranean species. 2. *Lolium italicum*, A. Br. 3. *Medicago sativa*, L.?

T. O. Hirst.—1. There is no good complete work on British Hepaticæ. The French "Hepaticologia Gallica," by T. Husnot, published by F. Savy, 10 fr. 50 c., and "Nouvelle Flore des Mousses et des Hepatiques," by J. Douin, published by Paul Dupont, 5 fr., are most useful. A complete work, "Hepaticæ of the British Isles," by W. H. Pearson, is in course of publication by Messrs. Lovell Reeve, in twenty-eight monthly parts at 5s. each, or 7s. 6d. coloured. 2. The Students' Handbook of British Mosses by H. N. Dixon and H. G. Jameson (Wheldon), price 18s. 6d., and the more costly "British Moss-Flora," by Dr. Braithwaite.—3. F. Walker, Insecta Britannica, Diptera, 3 vols., 1851-6; G. H. Verrall, List of British Diptera, 1888; F. V. Theobald, British Flies, vol. i. (all yet published), 1892; and, though not British, J. R. Schiner, Diptera Austriaca, Vienna, 1861.

D. A. H. (Barmouth). *Dianthus deltoides.*

Mary Barne.—The young bird was probably a hawfinch; but was the nair really $3\frac{1}{2}$ inches long?

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S. As he will be out of town during August, they should, from July 25 to August 31, be sent to "care of MESSRS. JOHN BALE, SONS & DANIELSSON, Great Titchfield Street, W." Letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 117. SEPTEMBER, 1899. Vol. X.

SELBORNIANA.

Birds of Paradise.—We are glad to hear that Messrs. Sotheran now have Dr. Bowdler Sharpe's monograph of the Paradiseidæ and Ptilorhynchidæ, or Birds of Paradise and Bower Birds, which is uniform with Gould's works, ready for delivery. It contains seventy-nine hand-coloured plates, and is published at £25 4s. in parts, £30 half bound, or £35 whole morocco. The edition is limited to 350 copies.

The Goldfinch in Danger.—Are we losing the goldfinch? An interesting note on this bird in a recent leaflet of the Board of Agriculture says it is now comparatively rare in many districts. As one reason for this decrease some say that the enclosure of commons, heaths, and other weed-covered areas has reduced the number of favourite resorts and feeding places of this bird, and that the seeds of weeds, which constitute its principal food, have become less easily obtainable on account of the improvement of agriculture. Others say that the ruthless bird catcher, who snares birds, often in spite of the provisions of Acts and Orders, throughout the year, is the real cause of this decrease of goldfinches, which are highly prized, both for cage birds and for crossing with canaries, on account of their fine plumage, their song, and their readiness to become tame and to learn tricks, while their peculiar "call-note" makes them useful to bird catchers as decoy birds. There is also a demand for goldfinches by bird stuffers, who arrange them under glass cases as ornaments, for which there is a ready sale amongst certain classes. Their beautiful feathers are likewise largely used for millinery purposes. The preservation of the goldfinch is desirable, not only for its beauty, but for its usefulness. As to its beauty, it is described as, without doubt, next to the kingfisher, the most beautiful of all British birds, vieing

in its bright colouring with some of the brilliant species in tropical climates. Its usefulness is particularly noted in orchards and fruit plantations. It clears off as food for its young quantities of the apple aphis (*Aphis mali*) and of the apple sucker (*Psylla mali*), as well as of the destructive caterpillars of the winter moth (*Cheimatobia brumata*). After nesting, the goldfinch feeds upon weeds, weed seeds, and grains. Before the weed seeds are ripe it eats the flower heads of chickweed, groundsel, and other soft weeds. Afterwards it takes the seeds of thistles of several species, and of other plants which have winged seeds, docks, plantains, burdock, dandelions, groundsel, sorrel, chickweed, and of various Cruciferous plants, such as charlock, wild mustard, and other objectionable weeds. Mr. W. P. Westell, of 5, Glenferrie Road, St. Albans, writes to say: "I have been approached as to instituting a movement to afford protection to the bird, and I have drawn up a memorial which I propose should be presented, after some prominent signatures have been obtained thereto, to the chairman of every county council in our country, praying that he will bring before his colleagues the urgent need of by-laws extending the close season, and the proper enactment of these laws. The Society for the Protection of Birds, whilst appreciating my efforts on behalf of our birds, cannot help me financially, and it thus remains a matter of individual effort. Personally, I am only able to subscribe my mite, but if all those who are wild bird and Nature lovers will send me their contributions, be they ever so small, I shall be enabled to get the memorials printed, and properly and effectively distributed throughout every English county."

International Congress of Women.—Among various protests against the "arguments" of Sir H. Maxwell and Sir E. Grey reported in our last issue, we have received the following note from the Rev. F. M. Millard, of Otham, Maidstone:—

"I have not seen a full report of Sir H. Maxwell's speech 'for the defence,' as it may be called; but the report in the *Standard* represented him as using arguments so curiously one-sided (or, to use an expressive phrase in *Kidnapped*, 'tail foremost'), as to call for some comment; *e.g.*, the destruction of birds is deprecated on the ground that they destroy insects. 'But,' replies Sir H. Maxwell, 'are not insects wild creatures, and should not they be protected?' He appears to overlook the consideration that it is noxious insects of which we are thinking. If these are to be protected, so, by parity of reasoning, must tigers and cobras be. A Brahmin would no more destroy these, I suppose, than parasitic insects. Most Christians believe that we have the same right to kill both.

"Another notable argument (as reported), was to this effect: 'Birds are kept in cages, which is wrong and cruel. So long as this continues, why object to the killing of birds, which is no

worse?' Passing over the fact that a good deal depends on the kind of bird and the kind of cage, this is the old familiar argument that two wrongs make a right. Granting to the utmost the wrong of caging birds, how does this wrong diminish or palliate the wrong of killing birds for 'egret plumes,' &c.? We may regret to see horses docked as they sometimes are; does it mend matters to know that they also suffer from bearing-reins? Reasoning of this kind is so exceedingly common that it is desirable occasionally to call attention to it."

IDE HILL.

IN the beautiful stretch of country lying at the meeting-place of the three counties, Kent, Surrey and Sussex, and within thirty miles of London, rises the steep and wooded height of Ide Hill, giving from its top an unexpected wide outlook over the miles of open weald stretching away below.

It was only a week or two ago that we made our way to its top, climbing the steep sandy lanes leading up the hill, the high grass banks full of yellow tormentil, long spikes of agrimony, and here and there soft cloudy bunches of white bedstraw, with other gaily-coloured flowers. Passing through a gate we took a path still winding steeply upwards through a thick hazel-copse, which brought us out on the field crowning the top of the hill which a few weeks ago was a mass of glowing blue from the viper's bugloss with which it is covered, and which could be seen as a blue patch on the hillside from a mile or two away. The long spikes were now in seed, with here and there a few blue flowers still left, and lower down, covering the rough furrows of the field, were spreading plants of the pretty little field-pansy.

But the glory of the hill-top is the view which stretches away for miles to the south and west, a wide open stretch of wooded country bounded by the outlines of the hills of Kent, Sussex and Surrey. A few miles away to the south is the high wooded top of Saxonbury, leading to the ridge of Crowborough beacon, and the wide stretch of Ashdown Forest, while further to the west the view is bounded by more distant ranges of hills.

It was indeed a lovely view as we looked out over it in the soft blue haze of the summer afternoon, and one longed to have it kept for ever for the enjoyment of the public, as a place where the dwellers in our great city might come and carry away with them something of the peace and beauty of the scene.

An effort to acquire this piece of land is now being made by the National Trust.

The need of such places in the country is not perhaps so keenly felt as their need in large towns, but in these days of increased travelling, when so many of the dwellers in our great cities find their way to the country districts round, and when so much of that land, particularly near London, is being taken up for building, one feels that in years to come these spots saved from the builders will be the greatest boon to our ever-growing population. The plot of ground which is now for sale is fifteen acres of the summit and wooded slope of Ide Hill, and it is offered for £1,750. There is no other land within some miles really secured to the public, and the country round is being rapidly taken up for building.

If any of our members or friends feel inclined to help in an effort with which our Society is so much in sympathy, they are asked to send their contributions to Miss Octavia Hill, 190, Marylebone Road, N.W., or to the Treasurer of the National Trust, 1, Great College Street, S.W.

OBSERVATIONS FOR YOUNG BOTANISTS.

IX.—Flowers and Fertilisation.

I TAKE for granted that all young botanists know the general composition of a flower; so that I need not describe the various organs, but will invite their observation to their *uses*. These, of course, are the pollination of the stigmas and the subsequent fertilisation of the ovules. The application of the pollen to the stigma is secured in three different ways: by "self-fertilisation," the stigma receiving the pollen from the stamens of the same flower; "insect-fertilisation," when insects convey it from one flower to another; and "wind-fertilisation," when the air takes the place of the insects.

The question arises, what is the relative value of these three methods, if there be any difference? This depends upon what we mean by the word "value." All that any plant requires is to live a healthy life and bear plenty of good seed before it dies. Our expressions, such as "fine foliage," "beautiful flowers," a "handsome shrub," a "noble tree," &c., are unknown to, and have no meaning in plant-life; so that chickweed and groundsel are really far better off, from the plant's point of view, than many a "splendid" orchid or prize cucumber which sets no seed.

Let us begin with self-fertilised plants. These are often small and insignificant "weeds," as well as being annuals. Compare a flower of groundsel with that of a dandelion. In the latter the forked stigma *protrudes* high above the florets,

having swept out the pollen from the anther-tube, and is now ready to receive it from another flower; but in the groundsel it remains *included* within the anther-tube and so gets at once dusted with the pollen. Chickweed opens its flowers and yields a minute drop or two of honey on warm sunny days; but in the cold weather and all through the winter if there be no snow it goes on seeding within its closed-up flower-buds. Again, the flowers of the violet set no seed in this country, though they do so in America and Italy; but if you turn up the leaves in summer you will find numerous buds which never open, but set an abundance of seed. They are called "cleistogamous," a word meaning "concealed union."

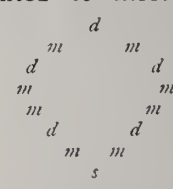
Wind-fertilised flowers are often small and insignificant, as on nettles, docks, sorrel, and appear to be as easily pollinated as the preceding, to judge by the seed set; for a characteristic feature of both is the extraordinary abundance of seed they bear. Chickweed and groundsel and other similar weeds will soon completely over-run a garden, if allowed to have their own way. Another peculiarity is that, if we compare the distribution of plants over the globe, those with large flowers which are regularly pollinated by insects are limited in range; whereas the others are cosmopolitan wherever the climate permits of their existence. Thus I have before me the annual nettle (*Urtica urens*) so troublesome in gardens, from Monte Video, and the sheep's sorrel (*Rumex Acetosella*), from the Falkland Islands; chickweed from Campbell's Island; the stork's-bill (*Erodium cicutarium*), from Patagonia, &c.

With regard to insect-fertilised flowers, they are mostly very conspicuous, and, as stated, limited in range. They are, moreover, not nearly so fertile, as a rule, when compared with the preceding. Thus a particular plant of an orchid, a species of *Dendrobium*, in its native home bore 40,000 blossoms; but produced only *one* pod.

Many flowers are *regular*, *i.e.*, have the parts of each whorl exactly alike, as the butter-cup. When such is the case they are mostly terminal on branches, and can be visited on all sides equally well. Many are *irregular;* they are then applied more closely to the stem, so that an insect visits them in one way only, or from the front, as we might say.

These have all been descended from regular flowers, for they not infrequently "revert" to regularity, as may be sometimes seen in the topmost flowers of a spike of larkspur, foxglove, snapdragon, pelargonium, &c.; and it is believed that the irregularities have arisen through the actual power of response to the mechanical strains to which the parts of the flower have been put by the weights and pressures of the insects themselves. Thus, *e.g.*, the calyx-tube of the *Labiatæ* has to support that of the corolla, but it is far too slender, as a rule, to bear the enlarged upper part together with the weight of the insect on the "lip." To strengthen the calyx nature has run up

several "ribs" just where they are wanted to meet the "drag" towards the front; thus, if *d* stands for dorsal, or mid-rib; *m*, marginal rib; *s*, a supernumerary rib, the adjoined diagram of the calyx of Salvia explains itself. The strain being all to the fore, double cords (*m*, *m*) are inserted on that half; while the strongest "drag," or "pull," is at *s*, exactly in front.



When the uses of stamens and pistil were discovered by Sir Thos. Millington (Professor of Botany at Oxford) in the seventeenth century, it was thought that every flower which contained both was self-fertilising; so Linnæus noticed that the stigma was, as a rule, *below* the anthers, so that pollen could *fall* upon it, as in the *Fuchsia*. But a very common feature in insect-fertilised flowers is that the pollen is shed *before* the stigmas are matured to receive it; such, indeed, is the case with the *Fuchsia*. This is another hindrance to such flowers setting seed so easily as the regularly self-fertilised, as in them the pollen and stigmas are ready at the same time, and always applied directly to each other.

Various features should be noticed in flowers. Thus, if insects come, they expect to find honey, and if the flower be regular, the honey-glands are formed all round the flower. Thus they occur on the receptacle in many plants, as the wall-flower, geraniums, &c.; on the sepals in the lime; on the petals in buttercup, aconite, and larkspur; on the stamens in chickweed and in some species of *Clematis;* on the pistil in marsh-marigold, and several of the *Gamopetalæ*. Wherever they occur they are invariably so situated that an insect alighting on a flower can secure the honey in the easiest way.

If the corolla has a petal in front, then this generally becomes enlarged and forms the landing place, as in so many irregular flowers, the dead-nettle, snapdragon, &c. If, however, there happen to be no petal in front, then the insect alights on the stamens, and generally the style as well. They then bend downwards at the base, but become upturned at the end, and are called "declinate," as in rhododendrons. It sometimes happens that they have chosen the stamens in preference to the front petal. If this be the case, that petal becomes reduced in size, as in Germander speedwell (*Veronica Chamædrys*), or may disappear altogether, as in the horse-chestnut.

In every case there are numerous features in the structure of the flower which, if carefully observed, will show that they all conspire to secure one end, that the insect secures the honey and gets dusted by the pollen at the same time; while the stigma is so situated as to strike the insect on the spot—back or front, as the case may be—where the pollen has been deposited from a previously visited flower.

Mr. Darwin thought, from numerous experiments in "cross"

and "self" fertilisation, that the former was the best, and that the latter was very bad; but he overlooked an important point. "Crossing" is a *temporary*, not *permanent*, stimulus. Florists get finer and more vigorous plants, handsomer flowers, greater variation in colours, &c., and *at first* more seed, but they soon get to the end of their tether. In a few years the "best" flowers set no seed, or very little, or it is very difficult to secure it; and they not infrequently lose their plants altogether if they are such as cannot be grafted. It is by this means, or by bulbs, as in hybrid narcissi, that they are often alone able to preserve the "improved" plants.

PALLAS'S SAND-GROUSE.

AFTER a lapse of eleven years England has again been visited by a flock of Pallas's sandgrouse, and their arrival naturally excited much interest in ornithological circles. Our knowledge of the causes of bird migration is, in spite of extended observations and investigations, still so slight that no satisfactory reason can be assigned for the rare irruptions of this peculiarly Central Asian species into Western Europe. There is little doubt that the sand-grouse have for centuries been in the habit of making spasmodic excursions beyond the limits of their desert home; but until 1848 they were quite unknown in Europe. In that year a single specimen was taken at Sarepta on the Volga. Five years later several examples occurred in the same district, and in May, 1859, a pair is said to have been killed in the Government of Vilna, on the eastern borders of Russia. In the same year a few specimens were seen in Western Europe—one in Jutland, another in Holland, two in England, and one in Wales. Two months after the pair were taken in Vilna, a solitary example was shot at Walpole St. Peter, in Norfolk, this, I believe, being the first recorded occurrence of the bird in the British Isles. In the following year another specimen was obtained in Sarepta. These isolated instances attracted little more than local attention: it was not until 1863 that an event took place which has been pronounced "the most remarkable fact that has ever occurred in the history of ornithology." This was the invasion of Western Europe by a "host" of Pallas's sand-grouse, estimated by Professor Newton to have numbered no less than 700 birds.

A large flock of these birds arrived in England somewhere about the 21st May, and a few individuals strayed as far as Ireland. By far the greater number, however, appear to have remained in our Eastern Counties, where they divided themselves into flocks, ranging from seven to sixty birds, and frequented, for the most part, sandy fields and tracts of heath-

land, both inland and near the sea. That the gunners of the districts in which they appeared did not allow them much rest, may be judged from the records of Mr. Stevenson, who reckoned that as many as seventy-five specimens were shot in Norfolk and Suffolk between the months of May and November. Professor Newton, who devoted much attention to the subject, estimated that the number of birds obtained in these two counties exceeded that of any other district of like size in Europe. The value of the birds was not at first appreciated by some of the gunners, for certain examples which fell to them were forwarded to the London poulterers. A male taken alive at Elveden, however, got into better hands. It was shot at and wounded by a man who said it "shruck" like a golden plover. Afterwards it was picked up among some long grass in which it had concealed itself, and brought to Professor Newton, who kept it alive by feeding it on canary-seed. He subsequently sent it to the Zoological Gardens, where, according to Dr. Churchill Babington, it lived, in company with several others from China, for nearly a year. Of the large flock which crossed the North Sea in May, the last had vanished by the end of autumn.

Small flocks of Pallas's sand-grouse visited us in 1872 and 1876; but it was not until 1888 that there was another large irruption of these birds into this country. Their arrival in that year is well remembered. They came over the sea in parties of varying numbers between May 6 and May 15; about a month after they had crossed the boundaries of Asia and entered Europe. Before any public announcement was made of their arrival here, a dilapidated specimen was picked up on the beach at Corton, in Suffolk, taken to a local naturalist, who handed the feathers to Sir Edward Newton. A few days later four sand-grouse were shot at Blundeston, a hamlet adjoining Corton, and the next morning the newspapers announced the return of the species to our shores. Like their forerunners, the flock of 1863, the arrivals of 1888 showed a marked preference for the Eastern Counties, large numbers of them being seen in Norfolk, Suffolk, Lincolnshire, and Yorkshire. Even in the marshy districts of these counties they were not uncommon, and a friend of mine, Mr. Last C. Farman, saw several flocks of them on the Norfolk Fens. In consequence of the renewed interest displayed on the subject of this immigration, I communicated with Mr. Farman, who kindly sent me the following notes:—

"My first intimation of the arrival of Pallas's sand-grouse in Norfolk was through a short note which appeared in the local Press respecting one of the species being picked up on Yarmouth beach in May, 1888. I had no idea at the time that a large flock had arrived on our shores. At the same time I was puzzled at the sight of several companies of these birds crossing the Haddiscoe marshes. The flight of the sand-grouse so much resembles that of the golden plover that I mistook them for the latter birds. As I had never before seen such large flocks

of golden plover during the month of May, I was somewhat astonished at the appearance of the flocks, and wondered if they could really be plovers. Then Colonel Butler, of Herringfleet Hall, who was well acquainted with sand-grouse, identified some of these birds in our locality, and the news of their presence spread through the medium of the Press. Taxidermists and dealers offered good prices, such as £2 a piece, and soon the Norfolk gunners commenced the slaughter of the innocents. In a few days I saw several victims which had forfeited their lives through putting confidence in the Norfolk Nimrods. I never flushed any of the birds from the ground, all I saw being on the wing and flying at a tremendous speed. A friend of mine, however, walked quite up to a large flock which had settled by the side of a ditch near the village of Haddiscoe, but not being a naturalist he failed to note whether they were drinking or feeding on the chickweed which grows in quantity at that particular spot. A flock of thirteen birds spent more than a week in a sandy field near Aldeby Church. They were so tame that the village boys used to throw stones at them. As this was in the month of May, fewer guns were in use than during the winter months, consequently the birds were all allowed to leave the village. This the natives greatly regretted when they learnt the value of their strange visitors."

According to Professor Newton two pairs of sand-grouse nested in the east of Yorkshire, and others on the Culbin Sands, in Moray, whence a nestling two or three days old was sent to the distinguished ornithologist. This nestling was exhibited at the Annual Meeting of the British Association. Of the flocks that came over in 1888 some are said to have remained nearly four years; but by 1892 the last of them had left us. So far as this country was concerned, an attempt was made to protect the birds, Mr. Sydney Buxton succeeding in getting an Act passed by Parliament making it a penal offence to destroy sand-grouse at any time of the year. The Act came into operation too late to do any immediate good; but it is still in force and, with the assistance of County Councils, may prove some protection to flocks of sand-grouse which visit us in the future.

Of the habits of Pallas' sand-grouse in their native haunts very little is known. According to one ornithologist, they are in all probability the "Barguerlac" of Marco Polo, and the "Loung-Kio" or "Dragon's-foot" of the Abbé Huc, author of "Souvenirs d'un Voyage dans la Tartarie." Their home is in the Kirghis Steppes; but their range extends to Turkestan and the region of Lake Baikal, Mongolia, and Northern China. The whole family of sand-grouse are fond of basking in the sun, in holes scraped in the sand, and the late General Prjevalsky, who encountered Pallas' species in the course of his travels, writes:—"After their morning feed, the flocks betake themselves to some well or salt lake, apparently preferring the fresh to the salt water. At the drinking-place as well as at the feed-

ing-place, these birds never settle on the ground without first describing a circle, in order to assure themselves that there is no danger. On alighting they hastily drink and rise again; and in cases where the flocks are large, the birds in front get up before those at the back have time to alight. They know their drinking-places very well, and very often go to them from distances of tens of miles, especially in the mornings between nine and ten o'clock, but after twelve at noon they seldom visit these spots." In North China the natives are said to catch considerable numbers of sand-grouse by scattering small green beans in the neighbourhood of bird-nets. The crops of specimens obtained in England were found to contain, for the most part, seeds of various leguminous plants, such as the clovers and medicks.

Although the flock which visited England this year was first observed in January, Mr. John Cordeaux, who recorded its arrival, thought it quite possible they had remained unmolested in this country all through the winter, as their chief haunt, "twenty-four acres too poor for cultivation and recently laid down in grass," is situated in an unfrequented and retired locality among the Lincolnshire Wolds. It was remarked that in choosing this district the birds followed the example of their forerunners in 1888, for it was in the very same field that the latter first appeared in Lincolnshire. Of the flock of 1899, Mr. Cordeaux wrote to *Knowledge* that they were "first seen by the rabbiter in the last week in January, the same man whose son shot five in 1888; and subsequently, by several competent observers in the neighbourhood, some of whom, by previous experience, had become well acquainted with the birds. The locality is lonely and retired, and it says much for those who from time to time saw them that they were never shot at, or otherwise disturbed, on this or on the adjoining farm. They did not always keep in one flock, but separated into parties, and frequently took a flight of about a mile to two large fields of wheat in the low country, and on being flushed, returned to the same field on the Wold. In fact, this locality seems to have offered special attractions, and it was here I got the feathers from one of their dusting-places. During the arctic weather in March they became much tamer; the shepherd on the next farm told me he got so near them that he could see their 'little woolly feet,' and he knew them well, having had one given him in 1888. He said that they followed each other like partridges, but 'wabbled' a good bit when running in the snow. They finally and altogether disappeared about March 23, at the break up of the storm. I have since been informed that a supposed flight of sand-grouse were seen on Flamborough Head in March."

This, I believe, is the last credibly recorded occurrence of sand-grouse in this country in 1899. I may mention, however, that in May I was informed that a "sandy-coloured" bird had been seen on the Gunton Denes, near Lowestoft. It was described as being "about the size of a partridge, but flew like

a grouse." Sand-grouse are known to have frequented these denes in 1888, and it was on the adjoining beach that the dead specimen, afterwards sent to Sir Edward Newton, was found.

WILLIAM A. DUTT.

MUSCICAPA ATRICAPILLA.

AS a pair of these birds nested in a box placed for them in the garden during the summer of 1897, and brought off their brood in safety, a few particulars of the event may be worth recording.

This particular pair were not among the first arrivals in the neighbourhood. By April 29—and possibly a few days earlier, for I was from home—two cock pied flycatchers had returned to their old stations on a strip of adjacent woodland, and on May 1 the new-come hen of one of them was arranging, in a very quiet and matter-of-fact manner, for a fresh household in their last year's nest-hole.

However, old cock birds are generally in front of young ones. Besides, if the migrating hen flies straight back to her old nest-station as well as the cock (as seemed to be the case in this instance, as well as in another noticed last year), and if the old nest-hole is used again by them, no time is lost. There is then no delay in finding and courting a stray mate, none in discovering a right sort of hole—and about this last there is often great trouble and difficulty. Also the old birds are much less demonstrative than the young ones: they take everything—migration, courtship, furnishing—more as a matter of course. In last year's instance the old cock sang in his oak-home from arrival on April 21 to April 25 most beautifully, volubly, and with great variety of notes—and there is an immense difference in the singing of this species. But on the morning of the 25th, when his hen had come and was beginning with him very cautiously to fit up the hole afresh, he was positively silent; from which I conclude his singing to have been a signal.

Now, I believe our garden pied flycatcher was a young bird. His plumage was more brown than jetty; his white wing and head patches were not large, nor his breast snowy—indeed, there was a smutty fleck in the middle of its grey. His strains also were undeniably weak and poor. At all events, it was not till the morning of May 6 that, upon opening the house-door for an early walk, I heard the well-known strains pealing jubilantly over and over again from the scarlet oak in which the box was placed, and knew that I had lured my bird. There he was, flitting excitedly about the bare tree and the garden rail below, not the most beautiful of his kind, but a real pied flycatcher, in actual and delightful fact.

The morning was cold, with a high east wind, and our great

mountain was whitened with fresh hail. The early-nesting birds, with eggs already laid, scarcely sang at all; and even the new-come migrants, with courtship on hand, were almost silent. The wood warbler left his trill untried, and called instead his plaintive call: the redstart broke short off when he had but just begun his strophe. For never, indeed, was there a worse spring than this for redstart-singing!

Yet, despite these chilling airs, our flycatcher showed his high spirits by the happiest, liveliest bustle. He had clearly found the exact thing he wanted in the way of a house; and this, at the end of a possibly thousand-mile journey, made with an express view to immediate matrimony, is something to be proud of, and to be talked over. Also, as it presently appeared, he had a mate all ready in the back-ground. So here was life propitious for him, at its supreme moment, and his tiny, feathered body, by sound and motion, showed his state of exuberant happiness.

Soon the gentle hen was seen, appearing mysteriously from some distant shade, possibly of the adjacent wooded banks, and at once the cock gave up his aimless flittings and proceeded to business. He led her to the box, which was constructed of rough bark, and placed ten feet high on the trunk, just below a small shielding branch: then entered it, as if to give her courage for the hazard, and when she followed, came out and hung to the edge of the hole, with flattened, spread-out tail. For this is the peculiar manner of the species, that loves to hang swallow-wise to the nest-rim. By-and-bye the excitement subsided, or perhaps the traffic beginning on the adjacent highway suggested greater prudence, for during the later part of the day they were less seen, having apparently withdrawn to a more secluded spot.

The next morning, however, the same joy and bustle prevailed, the same enticing manœuvres were repeated, and the two circled in a close chase. Whereupon, while the cock sang his short strain excitedly round and about, the practical hen set at once to work upon a provision for the future nursery. Scanning the ground for bits, she began to carry them up to the box. Perhaps a morsel of straw was secured from the manure-heap, or a fragment of root from the bed; or a large dead oak-leaf (for the scarlet oak bears very large leaves, which excite the cupidity of building birds like this species and the redstart) was borne up by the stalk, and after many attempts and struggles finally relinquished at the too narrow doorway. This casualty happening several times hampered our little builder a good deal, so that she had to take up fine, small bits only. The fibrous bark of an old honeysuckle bush attracted her, as it has done other birds, and there, clinging to it—while her mate, intensely interested in all her doings, perched close by to watch—she would tug and tug in order to break off a ribbon from it. These labours, begun intermittently with an air of charmed leisure, grew each day more persistent and absorbed. They were doubtless started at

daybreak, and were generally desisted from in good time in the forenoon, when men most do go abroad. The little builder also became much more secret and much more agile at her building, collecting mostly when unseen upon the shady bank, and thence shooting straight as an arrow—and so swiftly as scarce to be detected—into the hole. Four days she laboured hard, and often after—even after laying had commenced, I think—carried up a contribution to the heap, until this filled a box-space measuring 4½ in. by 7 in. and 4 in. deep almost full to the top hole. In all this stuff, which consisted of grass-stems, rootlets, a sycamore seed-case, &c., all very fine and dry and light, there was no hair, and but one fragment of moss. Yet I have seen a woodland builder tear off moss from the trunk of a tree as well as break off rotten wood. The cushion spread equally all over the box, but at the farther end a neat bowl was hollowed for the eggs.

Towards the close of these labours, not only the hen became more cautious in her approach to the cherished spot, but the cock began regularly to absent himself, and might be found singing and feeding at quite a considerable distance away. However, returns had naturally to be made, and then he would escort his mate in the most joyous and demonstrative fashion. Preceding her, he would sing at every halt, and enticing her into the nest, would hang to the edge warbling faintly. At the same time he became very combative, would fly at great tit or sparrow venturing near with angry, rasping noises, while a misguided pair of spotted flycatchers that found the scarlet oak a convenient post over against their proposed nest upon the stable, he hustled incontinently about their business. His joy reached its prettiest height about May 18, when laying was presumably over, and his hen went into the nest as if to stay and sit. He then remained near, feeding and chasing other birds. He sang his loudest, fanned his tail, and moved it slowly up and down, and even—what is rarely done by the pied flycatcher, and only in excess of joy—circled out singing on the wing. "Clwee-clwee, clwee-fu, clee-fu," sang he, in tones not unlike those of the great titmouse.

However, when his hen was fairly settled to her long task, prudence again prevailed, and he left the spot. Whether it is a delusion to suppose that any cock-bird sings to cheer his mate in her long seclusion I do not know; but certainly our bird sang for no such reason, for he went quite beyond her hearing, and when danger threatened her he was not near enough to know it.* Indeed, all became so silent and still about the scarlet oak that I feared some accident and desertion of the nest. And so on the 27th it was entered,—the only disturbance we gave them,—and when the lid was raised the little brown hen was disclosed,

* I have known exactly this state to prevail at the same stage of the wood warbler's nesting. To allay suspicion the cock-bird appears to keep away.

pressed low upon her treasures, which she refused for some seconds to leave. Then she flitted off without a sound, and waited near. The six warm eggs were more like the redstart's than the flycatcher's, of a clear greenish-blue tinge on white.

A few days later, when she was sitting the closest, the cock came occasionally to carry her food. He would pause on a bough for a return stare at me, when I perceived that he could sing a few notes with ease while still holding an insect in his beak,—as, indeed, all birds can. These few notes probably resulted from nervousness; for I have known the cock blackcap, when I have flushed him from the nest, to sing a short strophe in my face; but the pied flycatcher never at any time uttered his alarm cry at me, and the pair came to show no fear at all of human beings, while a cat or a dog below the nest threw them into a passion of terror.

Indeed, I almost surmised the cracking of the eggs from the nervous behaviour of the hen. On June 3 she was off her nest some time, and upon the shady bank—at quite a distance—could be heard hounding some enemy along with other birds that had nests near, crying "spick, spick," and throwing her wings high. The cock, with better nerve, remained indifferent. I saw no food carried into the nest that day or the next, and the hen when she entered remained awhile as if to brood, but on the 5th both carried food in, and feeding after that was conducted regularly and increasingly. The hen was less to be observed in her collection of supplies, but the cock took a bold post on the rail or dahlia-stick, and was constantly seen about his task.

This species catches its food much in the manner of the redstart—more, indeed, than in that of the spotted flycatcher. Part is caught within the foliage of a tree, the bird winging about the leaves as it nips up the startled flies; but much is taken from the ground, and I have often watched the woodland birds, as well as our garden-dwellers, survey—from some low bough—the ground with keen eye, and then pounce down upon the moving, creeping creature. Our bird killed what he caught—beetle, or wee grub, or grass-fly—by a smart rap on the ground or the rail, before carrying it to the youngsters. He changed his hunting-ground from side to side, but the area was limited, more so than that of the redstart, which species flies rapidly to nest from a tolerably safe distance. Sometimes, if the weather was cold and wet, he economised his journeys, and took up quite a beakful at a time. Indeed, on June 16 came such a storm of rain with a bitter north wind as broke the plants and flowers, and drowned many nestlings in open nests.

Our birds, though their nestlings were safe within the box, had some ado to get them food; and to see them, upon some slight abatement of the storm, drift about the open ground, which they seemed to prefer to the drenched foliage, in search of something to eat, was to realise their sorry need. The cleanliness of the nest, too, had become their care, and they would then fly

straight off to a distant tree, where they carefully wiped their beaks. By this time the young were chirping loud.

On the 20th the hen fussed over a distant cat, and on the 21st a youngster was leaning far out of the nest, with another behind. By the afternoon all had flown: the nest was empty. Not a youngster remained even in the scarlet oak, and the only one I could locate was already at a distance of some forty yards in a rowan-tree, below the river-side oak. It was a most immature little body, browny and speckled with tiny wing-patches, while already it swung its short, wide tail up and down. It chirped loudly, and was frequently fed by the cock, who tried to entice it higher up the oak-tree. Indeed, I think these birds get their youngsters almost at once out of sight to the tops of trees, for last year I discovered, by accident, a hen pied flycatcher feeding her fledglings in the top of an oak-tree, when the three of them were so immature as to cuddle in a heap and tumble over each other on the big, horizontal bough.

By the next day all our birds had disappeared from the garden. I believe, however, they had only crossed to the oaks at the other side the river, for thither on the 27th they were tracked through the cock, who now began, with the burden of his family lifting from his shoulders, to sing again weakly, and to preen himself inertly in the trees. Still, on the 29th he followed a cat with fussy cries, and still, after winging for flies in the sycamore-bough, carried a contribution to some hidden chirping youngsters. But after this they vanished altogether. Were they gone for good?

I thought so. But now came an interesting episode, one that confirms my idea that birds, after wandering from their nest-centre, often return to it again before the start of their long migration. On July 18 a young pied flycatcher alighted on the garden-rail by the river, eyeing me curiously as I sat, and swinging its dark tail—a sure mark of species, that distinguished it more than any other from the very similar young spotted flycatchers about the palings at the same time. After feeding a while it passed on to the scarlet-oak, and thither also went, passing more swiftly, other birds. Then I heard the "spick" cry; heard it, too, at day-close from the shady bank where the hen had been wont to retire, and continued to hear it till July 29, without, however, ever catching a glimpse of the birds. That was the last of the pied flycatchers, for that summer.

MARY L. ARMITT.

REVIEWS AND EXCHANGES.

Essays and Nature Studies with Lectures. By W. J. C. Miller, B.A., edited by H. Kirke Swann. Bale, Sons, & Danielsson, Ltd. Price 10s. 6d. net.

MANY readers of NATURE NOTES whose memories go back four or five years will be glad to have this volume as a memento of our valued contributor, Mr. W. J. C. Miller. It contains an appreciative biographical introduction, a not very satisfactory portrait, and seventeen of Mr. Miller's pleasantly written essays, nine of which are reprinted from this magazine, whilst five others are on more purely literary topics.

Field-path Rambles (*eleventh series*), *comprising routes round Oxted, Caterham, . Godstone, &c.* By Walker Miles. R. E. Taylor & Sons. Price 6d.

Having known almost every inch of the ground covered by this series of rambles from our earliest boyhood, we can unhesitatingly recommend it, especially to members of our Field Club and our Croydon Branch, as a thoroughly practical and accurate *vade mecum*.

Wild Flowers of Barmouth and Neighbourhood. By James Kynoch. Third edition. Published by the Author. Price 3d.

This catalogue of Latin and English names in systematic order, without localities, we are glad to say, and with a fairly small proportion of mis-spellings, will no doubt be useful as a check-list to visitors to this lovely tourist centre. Meanwhile, we are pleased to hear from Mr. Kynoch that Mr. D. A. Jones, F.L.S., of Harlech, is preparing a comprehensive flora of Merioneth.

Insects: their Structure and Life; a primer of Entomology. By George H. Carpenter, B.Sc. J. M. Dent & Co. Price 4s. 6d. net.

It is a great consolation to those "exiles from Erin" who take an interest in natural history to think that the interests of science are so well looked after as they are by Messrs. Praeger and Carpenter, the editors of our esteemed contem-

Mayfly (*Ephemera vulgata* L.), natural size, and larva, magnified.

porary, the *Irish Naturalist*. We have several times been indebted to the botanical pen of Mr. Praeger, and now his colleague places us under a deep obligation for a thoroughly workmanlike handbook. We do not remember to have

seen any scientific books published by Messrs. Dent; but, if this very handy little octavo of about 400 pages, with nearly 200 illustrations, which are none the worse because most of them are borrowed (with full acknowledgment) from standard authorities, issued at 4s. 6d., be a sample of works they purpose publishing, we can only hope they will "go on and prosper," for we consider it a marvel of cheapness. The typography does credit to Messrs. Turnbull and Spears of Edinburgh. Not the least merit of Mr. Carpenter's work is the admirable sense of proportion which it evinces; and we do not think we can better describe the scope of the book than by stating that it devotes 83 pages to anatomy, 44 to life-history,

Common Earwig (*Forficula auricularia* L.) magnified.

Tail-forceps of three male earwigs, showing variation. Magnified three times.

33 to classification, 120 to the orders of insects, 64 to bionomics, 35 to the pedigree f insects, 14 to bibliography and 11 to the index. Though there is none of that wealth of anecdotic lore on the marvels of "instinct" that made "Kirby and Spence" the delight of our boyhood—in fact, the word "instinct" does not occur in Mr. Carpenter's index—the well-told stories of symbiosis, of mimicry, of family life and social communities in the insect world are as romantic as anything in the whole realm of Nature. We trust the author is exaggerating when he writes in his Preface of "the thousand and more original works on insects now published yearly;" but so far as our own limited knowledge goes, we are not acquainted with any work that quite occupies the ground of this valuable little book. We are able, by the kindness of Messrs. Dent, to give three examples of the illustrations. Many others are taken from Professor L. C. Miall's "Cockroach" and from the publications of the United States Department of Agriculture.

A Glossary of popular local and old-fashioned Names of British Birds. By Charles Louis Hett. Jacksons', Brigg. Price 6d.

This is a reprint of the glossarial portion of Mr. Hett's Bird Dictionary. Though it is perhaps inevitable in so cheap a booklet, there seems to us to be not a little inconvenience in the system by which every name in the glossary is followed merely by a number, entailing reference to another list, that of birds accepted as British by the British Ornithologists' Union in 1883, in another part of the book. We should also have liked some indication of the districts in which the local names are used.

The Larvæ Collector's Guide and Calendar, giving the times of the appearance of the British Macro-Lepidoptera in all their stages. Printed and published by J. & W. Davis, Dartford. Price 1s. net.

Its title hardly does justice to this useful publication; for it gives in scientific order the food-plants of the insects and substitutes for them, and comprehensive notes on rearing Lepidoptera from ova, larvæ and pupæ. Running, as it does, to ninety pages, and bound in cloth boards, it is certainly cheap at a shilling.

All About Birds. By W. Percival Westell. "Feathers" Publishing Co. Price 1s. 6d.

Mr. Percival Westell's title is ambiguous. His book is, no doubt, all about birds, and no sane person would expect a book at the price of eighteen pence to contain all about birds. Nevertheless, to our taste, this book would be dear at any price. We do not demand pure science or merely systematic works; but a hotch-potch of newspaper snippings, good, bad and indifferent, without arrangement, table of contents, or index, does not seem to us likely to "stimulate interest" or to further the intelligent study of nature.

Darwinism and Lamarckism Old and New: Four Lectures. By Frederick Wollaston Hutton, F.R.S. Duckworth & Co. Price 3s. 6d. net.

These lectures by one of the earliest students of Darwinism are most suggestive, closely reasoned and comprehensive; but let no one be deluded into the notion that, because they form a small book in large type, they are a merely elementary or "popular" *réchauffé*. They require careful study and will repay it; for it is remarkable how open-minded Captain Hutton has remained during the forty years since he greeted the first publication of the "Origin of Species." The lecture on "Darwinism in Human Affairs" has wide bearings far beyond the region of natural history. The volume has as frontispiece a charming heliogravure portrait of Lamarck.

From Comte to Benjamin Kidd: the Appeal to Biology or Evolution for Human Guidance. By Robert Mackintosh, D.D. Macmillan & Co. Price 8s. 6d. net.

There is little or no biology in this work. It is confessedly a mainly hostile review from an intuitionalist stand-point of all those writers upon ethics from Comte onwards who can in any way be spoken of as his followers. The author starts with the assumption of "the trustworthiness of the moral consciousness," and devotes needless pains to the not very difficult task of showing that philosophical writers often contradict not only one another but themselves. The work is entirely outside the scope of this magazine, but is one which cannot well be disregarded by any who interest themselves in the wider application of biological teaching.

Received.—*The Arithmetic of Electrical Measurements*, by W. R. P. Hobbs; *Animal World*, *Animals' Friend*, *Our Animal Friends*, *Humanity*, *Naturalist*, *Irish Naturalist*, *Science Gossip*, *Knowledge*, *Agricultural Economist* for July and August; *Victorian Naturalist* for May and June.

NATURAL HISTORY NOTES AND QUERIES.

Squirrels.—I find that in the month of June, especially, when squirrels are pressed for food, they greedily devour the eggs and young of all kinds of birds. I was not aware of this fact till I saw a squirrel eating a thrush on one of my garden walks. I soon had evidence of their greed for eggs. I have a number of doves, which are quite tame and nest in the shrubbery. One pair had a nest within fifty yards of the house, with two eggs. I found a squirrel devouring the eggs. Another pair nested in the *Clematis montana* overhanging the dining-room window. One young dove was hatched out, but my gardener found a squirrel in the nest with the young bird half eaten. Hitherto I have carefully protected squirrels as delightful little creatures, enlivening and adding to the beauty of

Nature, but I have decided to allow far fewer than before, as they are doubtless most destructive to fir trees, to fruit, and to the eggs and young of birds.

Hexford House, near Guildford, M. C. PERREAU,
August 12, 1899. Colonel.

Canaries.—Miss Morgan had a Belgian hen who invariably laid six eggs, though she never hatched more than five, and one of her progeny, hatched early in 1895, laid seven eggs the following spring, and hatched them all.

St. Aubyn's, Hove.

The Cuckoo's Note.—I have been interested in reading the remarks of J. G. Bradford in NATURE NOTES for August, on the above.

Several weeks ago, while walking along a country road, I was surprised to hear a most unusual sound, like a mild trumpet call. It came from a large bird flying across the road, about a hundred yards off. At the time I thought it must be either hawk or cuckoo, but the flight was so rapid it was difficult to realise, and the bird quickly out of sight over a rising ground. A very small bird was flying close behind it. The notes were like too-too-too—the first and second loud and distinct, the third soft and low. I have little doubt it was a cuckoo, and the notes similar to those referred to by J. G. B. I never heard the like before, and had no idea that the cuckoo had any other note than the well-known one.

Helensburgh, August 9, 1899. E. ANGUS.

Nesting Twice in the same Nest.—We have had an instance of nesting in the same nest. A pair of flycatchers come every year and build in the same rose-tree on a wall. Generally the gardener when pruning in the autumn removes the nest, but last autumn he left it. The birds came as usual at the end of May or beginning of June and took possession of the old nest and reared a brood of four. They flew on June 29. The hen then laid two more eggs in the same nest, and the little birds are now big enough to look over the edge of the nest.

August 2, 1899. B. S.

Bird Singing at Night.—Can any of your readers tell me what birds beside nightingales sing at night? I know there are others, but do not know their names. Between ten and eleven p.m. on the nights of July 10 and 11, I heard a bird singing in the orchard at the back of my house. The orchard is beyond the garden, on a hill, and I was in my bedroom, so the sound was a little above me. The bird sat apparently in the same tree each night. It had a short but sweet song. I have never heard a bird, excepting nightingales, sing at night before.

Hatfield, Herts. LUCY ROWLATT.

The Bramble Finch.—In the August number of NATURE NOTES a pair of these birds is reported to have built and reared a brood at Maisemore, near Gloucester. If your correspondent means the brambling (*Fringilla montifringilla*), would he kindly furnish further details, for as far as I know this would be the first instance of the species nesting in this country, and demands confirmation. As all ornithologists know, the brambling is a *winter* migrant to the British Isles, leaving in the spring. It breeds throughout the northern portions of the Palæarctic region, amongst pines or birches, laying six eggs.

Sale, Manchester. GRAHAM RENSHAW.

SELBORNE SOCIETY NOTICES.

Donations towards Reduction of the Deficit. — The Council acknowledges with thanks the receipt of the following donations:—Dr. Lionel Beale, 20s.; H. Horncastle, Esq., 5s. The following have increased their subscriptions:—J. Slater, Esq., to 20s.; Mrs. Morton Sumner to 10s.; and Mrs. Arthur Hill, £2 2s. (to the Ealing Branch).

Council Meetings.—The next meetings of the Council will be on September 5 and 19.

Field Club Rambles:—

September 9.—Titsey Hill. Leave London Bridge, 2.55; Victoria, 2.30; East Croydon, 3.19, for Woldingham, where meet at 3.40. Cheap return

ticket, 1s. 6d. Walk to Bodley Cottages, top of Titsey Hill, where tea at 6 p.m. Return from Oxted 8.19 p.m., paying excess to Woldingham. Guide, Mr. M. Mühlberg.

September 16.—Belmont to Chipstead. Victoria, 2.14; London Bridge, 2.14; Sutton, 3.10, where change. Meet at Belmont at 3.13. Tea at Banstead. Guide, Mr. E. A. Martin, F.G.S.

September 23.—Bickley to the Town Court Woods, St. Paul's Cray and Chislehurst Commons. Leaving Bickley Station (L.C.D.R.) after the arrival of the trains leaving Victoria at 2.30; Holborn Viaduct, 2.25; St. Paul's, 2.28; and Herne Hill at 2.41. Guide, Mr. A. B. Wilkinson.

September 30.—Oxted, Tandridge and Godstone Station. Leave Victoria, 2.30 p.m., or London Bridge, 2.25. Take single tickets to Oxted. Fare, 1s. 8d. Arrive Oxted, 3.27. Return from Godstone Station, 6.50. Fare, 2s. 1½d. Arrive London Bridge, 7.45; Charing Cross, 8.1. Guide, Professor Boulger.

NEWS FROM THE BRANCHES.

Bath.—*Saturday, June* 24.—The garden party at Claverton Manor, which the genial President of this Branch gives every year to the members, was so largely attended that many members could not get into the library where Mr. Skrine read some very interesting reports, botanical and ornithological in character. Mr. Baker informed the company that a number of the drawings shown by him last year at one of the Selborne meetings are to be published in a forthcoming volume on Lepidoptera. The drawings are chiefly of butterflies' and moths' eggs greatly magnified. Mr. Scott caused some amusement by reading a newspaper cutting about a hen in Bath, which, it was said, had laid eggs with the face of a clock embossed on them. After tea an enjoyable stroll was taken around the beautiful grounds of the Manor.

Thursday, July 6.—Surgeon-Major Adcock conducted a very pleasant excursion to Saltford by the Newton Meads, skirting one of the most beautiful bits of the river Avon, which is very rich in its flora. Some large specimens of *Acorus calamus* were gathered, used very much in Prussia to put on the roofs of the houses. At Whitsuntide and Easter also it is used as a decoration and a fine liqueur is made from the root, which has a pleasant odour, something like cinnamon. Tea was taken at the pretty cyclists' châlet, one of the first to be erected. Now they abound in the neighbourhood and may be found at Cheddar, Brockley Combe, Box, Cribb Causeway and many other places dear to the wheeler. After tea boats were in readiness to take the members to Saltford village by water.

ANSWERS TO CORRESPONDENTS.

Mrs. Needham.—*Trachelium cæruleum*, L., a native of southern Europe.

Verax (p. 151).—Kindly send your address to the Editor, as he has a letter to forward you.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 118. OCTOBER, 1899. Vol. X.

SELBORNIANA.

English Bull Fights.—One of the most depressing of recent incidents to any one having a love for Nature has been the encouragement given by hundreds of English men and women to the disgusting barbarities perpetrated at Boulogne. The only consoling thought that saves one from the conclusion that as a nation we have made no progress towards humanity is that the press has been unanimously outspoken in denouncing these spectacles.

The Tormented Tiger.—We gladly reprint the following protest from *The Daily Chronicle* :—

"Sir,—The scene described in *The Daily Chronicle* as having taken place at the Alexandra Palace is a disgrace to civilisation, and should be held up as such. That an animal (in this case a tiger) should be whipped before the public, because he objects to ascend steps, &c., and attacks his daily tormentor when an opportunity occurs (and how he must hate him or her!), and that the public should submit to be reprimanded by the exhibitor for showing their disapproval of the whipping, is altogether an outrage against humanity, its sense of unfairness and cruelty, if it has any such natural sentiments left in these days of unprecedented tortures; also it is an outrage against common sense.

"Are the public expected to appreciate and become used to the whipping, and to stifle their feelings of mercy and good will to the dumb wild creatures who have been caught for the purpose of these exhibitions! A writer on this subject says that could the public daily witness the training instead of the show, they would protest instead of applauding, but it seems the public is to be gradually inured to any amount of torture; hot-ironing may be done before their eyes in the future. And what is it that they go to see?—a wild creature do what its muscles and anatomy were not made by the Creator to do. Why not go to see men walk on the ceiling, and allow another to flog them or prong them if they do not perform satisfactorily? As a matter of fact, walking on the ceiling has been attempted, and men have had the want of common sense to gaze at it.

"Shall we never have an Act passed to prevent the exhibiting of performing animals? Why should human beings have the power to lower the national character by such means? Why should children be brought to see and enjoy these senseless, cruel sights (practising a good deal of it at home on their own

pets in imitation afterwards)? Why exclaim against the brutality of old times and the bull-fights of to-day in Spain?

"The lie given continually that kindness alone is used to train wild beasts to do unnatural things is manifested by such exhibitions."

THE COST OF A SEALSKIN.—Now that winter is approaching we would call the attention of our lady readers to a pamphlet on "The Cost of a Sealskin Cloak." It is published by W. Reeves, 185, Fleet Street, price 2d.

THE GOLDFINCH. — We have received the two following letters:—

"On page 161 the question is asked, 'Are we losing the goldfinch?' As compared with years ago, going back at least fifty, there is no doubt they are annually becoming more scarce. I remember at that time there were flocks of hundreds at this season of the year, where I was even surprised to see ten or a dozen yesterday, and I have no doubt when their presence is known by the local men who have clap-nets, or by the Birmingham men who scour the country, on *Sundays* more particularly, they will soon be netted. Now is this fair to local bird lovers to be deprived of the beauties of Nature, and for farmers to be deprived of their best friends as weed-seed scavengers? They are supposed to be free or protected until the first of August; but this is not long enough, even on nesting principles, for many have then either eggs or young in their nests, and the old birds are caught and taken away.

"In Somersetshire, we read, they are to be protected all the season, or year, and this ought to be carried out in Worcestershire and other counties also if the goldfinch is to have a chance in life. During the past summer a Worcestershire clergyman invited me over to see his garden, &c., which he described as 'a paradise for birds,' and so I found it in many respects, but I found no goldfinches in the locality, neither did I see or hear but one, and my visit involved a walk through the country of probably thirty miles.

"The method of taking goldfinches I saw carried out about two years ago, and it may be of interest to those who never saw it to describe it. Clap-traps are (writing from memory) about five or six yards long and two wide, and two are used. They are spread on a level space on the field, and the inside of each net is fixed on the ground so that they shall fold over the edges when the strings are pulled from a distance of sixty to eighty yards. A good cock bird is used as a 'call bird,' the one used then being (I was informed) about twelve years old. A hen bird was used as a 'brace-bird,' which is the cruellest thing in the business, as being *tied with strings around the body, and under the wings*, she has no chance of escape, although on the approach of wild birds she is agitated with string fixed to her perch to *attempt to fly*, and consequently she is often hanging head downwards until she makes another attempt to fly, and then probably alights back on her perch or on a thistle stuck up as a decoy. On the wild birds alighting within reach of the folding nets the strings are pulled vigorously and the nets close over their victims. Birds often get killed or injured in this act, I was informed. The birds are then caught and taken out and placed in low cages or boxes with wires on one side only. If a good haul is made during the day they are crowded on top of one another and many die. If caught as grey-pates before moulting the mortality is great, and comparatively few are saved. The food of wild goldfinches, so far as my close observation extends, *does not* consist of many of the weeds mentioned on page 162, neither have I ever noticed them feed on any insect life, such as Aphis mali, Psylla mali, or caterpillars, while several of the most prominent seeds they feed upon are left out of the list, such as lettuce, and teazel, and others known locally as "blue-buttons," "hard-heads," and "wild-hops," all field plants on which goldfinches flock to feed, and where the catchers get aware of them.

"*Astwood Bank, Worcestershire.* JAMES HIAM."

"DEAR MR. EDITOR,—You ask, in the first sentence of the current issue of NATURE NOTES, whether we are to lose the goldfinch. Allow me to say that so far as my own experience goes, there is no chance of any such misfortune. My conviction is that the goldfinch is not only not diminishing, but slowly increasing in numbers. I have never seen so many as I have this year: almost every day just now I see them on the thistles, and this spring they bred in larger numbers in this parish than I have ever yet known. Our Rector told me last night that there were at least half-a-dozen nests in his garden and orchard. And this in spite of the fact that in this county we have taken no special steps to protect the bird in the breeding-season.

"No doubt these statements will be discounted or discredited by those who have once and for all made up their minds that the goldfinch is to disappear from among us. It will be said that my parish is a singular exception to the rule, and that I and others here must exercise a controlling influence on the enemies of the birds. Passively and unconsciously, we may do so; but neither I nor anyone else here have ever held a meeting or lectured or agitated on the subject. And I am inclined to think that we are not the only fortunate people in the possession of goldfinches, for I have seen them in other places more frequently than I used to. Lately at Tunbridge Wells, one of the most birdless places I know—not from persecution, but on account of the sandy and waterless nature of the soil—I was delighted to find an oak almost within the town quite full of goldfinches.

"I would venture to ask those who lament the disappearance of this species, whether they are quite sure that they do not often fail to see goldfinches, even when they are about. It is a curious fact that in spite of its beautiful colouring, the goldfinch is by no means an easy bird to be sure of. You must know the bird well, and you must look in the right places. When breeding they seem to me singularly difficult to get a good look at, even with a field-glass: they flit about over the trees in the orchard, and though not shy, are so restless that one has to be patient with them. Their nests rarely fall to the youthful depredator, as they are placed where he is not in the habit of looking. After the moult they show themselves more easily in the course of their search for seeds; but for many years I have noticed that I have always to point them out, even to persons who have some little knowledge of birds, and that I myself recognise them, not by their brilliant crimson or yellow, but by their flight or note or attitude. I nearly always have to turn the glass upon them before I can see their colours satisfactorily.

"I confess that I do not much believe in further legislation as a means of protecting these small birds, though it may be needed for the larger and conspicuous ones which are especially the prey of the egg-dealer and the private collector. Probably the Selborne Society has done more than Parliament for the good end; and in the case of some birds, still more has been done by mild winters and by the agricultural depression which raised the magnificent crops of thistles which we now unfortunately see in many parts of the country. If it be true that the extinction of the goldfinch was really threatened some twenty or thirty years ago, I should be disposed to guess that the real cause was the high state of agricultural activity and prosperity all over the country.

"Perhaps I may be allowed a word about one or two other species. In a recent number of the *Spectator*, Mr. Joseph Collinson stated that it is a well-known fact that not only the goldfinch, but the kingfisher, red-backed shrike, and reed-warbler are also diminishing in numbers. My experience does not tally with his statement in the case of any of these species. The shrike has never been, and never will be, an abundant bird; but in certain soils (as Mr. Aplin's researches have made clear to us) it is always to be found, and this year was more common in the neighbourhood of Oxford than I have ever known it, and approached to within a stone's-throw of the suburbs. As to the reed-warbler, I am quite at a loss to understand why it should be supposed to be a failing species. Its nest is not nearly so easy to find as that of the more abundant species, the sedge-warbler, and it is not searched for by the bird-catchers. If it is diminishing (which I do not believe) the cause must be looked for in Nature's workings, and not in the machinations of man. The same is the case with the kingfisher: a single prolonged winter will kill more kingfishers than all the owners of trout-streams, or purveyors of feathers for ladies' hats, destroy in a series of years. For the

last three years this beautiful bird has been more abundant in the Thames valley than I have ever known it.

"Depend upon it that Nature and rural economy have much more to do with the increase and diminution of species than some of our well-meaning enthusiasts are ready to admit. Let me take a case, which is too seldom insisted upon, though instances are everywhere before our eyes at the present moment. I do not think there is much doubt that the house-martin, a bird as beautiful and more useful than the goldfinch, is giving way before the relentless persecution, not of man, but of the sparrow. I am feeling this keenly, for this is the first year in which I have not been saluted in the early mornings by the twitter of the martins outside my windows here. They maintained an unequal fight for years, aided by me to the best of my ability, but they have now given up the game. As I write this, I can see clouds of sparrows, but not a single martin. Unless we can put down the sparrow—and in corn-growing country that is almost impossible—we shall gradually lose our martins, or they will have to develop some new method of nesting. This will be the result of natural and apparently unavoidable processes; the stronger species wins, and victory goes to the big battalions. Sparrows are useful enough in towns; but those who live, as I do, in a corn-growing country, can only look upon them as a pest. I cannot but think that it is time for the Selborne Society to take the sparrow question in hand.

"*Kingham, Chipping Norton.*" W. WARDE FOWLER."

WILLOW-GROUSE.—General Engelhardt records in "A Russian Province of the North" (Constable) that "A single river steamer on the Pechora carried ten tons of white wings of willow-grouse." . . . . "They can be dyed and converted into feathers of any other birds."

DESTRUCTION OF BIRDS FOR "AIGRETTES."—In the Report on the trade and commerce of Venezuela for the year 1898, which has been prepared by Mr. W. H. D. Haggard, Her Majesty's Minister at Caracas, and just published as a Parliamentary paper, reference is made to the destruction of birds for the supply of "aigrettes" for ladies' hats. The slaughter is really appalling. Mr. de Lemos, the Vice-Consul at Ciudad Bolivar, reporting to Mr. Haggard, says that "the export reaches this year the total of 2,839 kilos.; that 870 birds have to be killed to produce one kilo. of the smaller feathers, and about 215 for one kilo. of the larger. If, therefore, we take the average, the number of birds killed last year was 1,538,738, but if we take the highest number it was 2,469,930, and even the lowest accounts for the slaughter of 610,385."

ABOL INSECTICIDE.—At the beginning of the summer we received a sample of this insecticide from Messrs. E. A. White, hop and fruit growers, Beltring, Paddock Wood, Kent; and, a friend having thoroughly tried it, we are able to testify to the fact of its being most efficacious in destroying aphides without in any degree injuring the plants.

BRITISH MYCOLOGICAL SOCIETY.—The annual week's fungus foray of this Society will take place, under the presidency of Dr. C. B. Plowright, in the New Forest, on October 2nd to 7th, the headquarters being at the Crown Hotel, Lyndhurst. The Hon Secretary is Carleton Rea, Esq., 34, Foregate Street, Worcester.

Catholic Missionaries as Naturalists.—A curious and interesting circular is said to have been just issued to all Catholic missionaries by the Sacred Congregation of the Propagation of the Faith. It urges them to use such opportunities as the locality of their mission work affords for the collection of natural history specimens, to be given to scientific societies and institutions. The intention, it is asserted, is not only to interest and encourage such missionaries as are keen naturalists, but also to remove the reproach so commonly held that the Church does not look with favour upon science, and especially biological science.

OBSERVATIONS FOR YOUNG BOTANISTS.

X.—Origin and Dispersal of Fruits and Seeds.

ORIGIN OF FRUITS.—The effects of pollination and of fertilisation are the fruit and seed; for besides the formation of the embryo—the immediate result of fertilisation by the nucleus of the pollen within the ovule—its action affects the ovary as well, and very often other accessory parts, as we shall see.

Taking a pea-pod as representing the simplest form, this consists of the ovary alone, the peas being the seeds. In a strawberry, the numerous carpels become small seed-like bodies called "achenes," each being a carpel containing a single seed, to which it is tightly fitted. The effect of the pollen has been to stimulate the end of the floral receptacle to grow into a large succulent mass which we eat. It requires the agency of all the carpels to be developed in full; for if it happens that a few were not fertilised, there will be a little depression, within which are barren carpels crowded together. That spot remains more or less green.

A further condition is seen in the hip of roses, and in apples and pears. In these the receptacle has grown up into a cup carrying the calyx, corolla and stamens on the top of it; but leaving the carpels below within it. It is *free* from them in the hip, but *united* to them in the apple and pear. In these last, the *outer* epidermis of each of the five carpels is not formed, nor is the *inner* epidermis of the cup, so that the middle, soft tissues of both are blended together. This tissue becomes greatly increased in quantity and supplies the part we eat; the *inner* epidermis of the carpels alone constitutes the "core," leathery in the apple but stony in the hawthorn and pear.

In the plum and peach, the fruit is really comparable with a pea-pod; both are metamorphosed leaves; but as a leaf usually contains no active tissue (called "cambium" in a stem), it cannot grow when once fully formed. This active layer is

retained in the carpel. In the pea it develops a rather tough inner lining to the pod. In the peach this lining becomes the "stone," the flesh, of course, being the usual central tissue or "mesophyll" of a leaf.

In the mulberry, the effect of fertilisation is now seen in the calyx, for each flower consists of four sepals and a pistil only; and while the latter ripens into a seed-like achene, the sepals become fleshy and deep purple in colour, a dense cluster of them constituting the mulberry fruit.

The pollination may affect the pistil, without any fertilisation at all. This is seen in seedless fruits, as in Sultana raisins and grocers' currants, both being grapes; whilst cucumbers, bananas, some oranges, pineapples, &c., often have no seeds at all. A similar result often occurs when florists try to hybridise plants, by putting the pollen of one species upon the stigmas of another. Full-sized fruits may be, and often are formed; but when they burst not a trace of a seed may be there.

Structure of Fruits.—The varieties of fruits are endless. They may be dry and bursting, as of a pea, or fleshy and indehiscent, as are berries.

Dry Fruits.—Taking a pod to start with, a similar fruit is seen in several of the buttercup family, such as the columbine which has five carpels in each flower, quite separate: they burst down the margins of the carpellary leaf, *i.e.*, inwards. In magnolias similar "follicles" occur, but they are so rigid that the seeds could not escape, so nature splits them down the back and lets them out that way instead. In *Nigella*, "love-in-a-mist," the five carpels are united by their edges, and so we get a "capsule." But there are many sorts of capsules, and various ways of bursting; sometimes by valves, *i.e.*, by splitting off like doors from one end to the other, as in wallflowers, willow-herbs, orchis, &c. In *Cardamine hirsuta* and in balsams the valves come off elastically, curl up, and so throw the seeds to a great distance. A follicle may, however, lead us in another direction, for the buttercup family has "achenes" as well as "follicles." If a follicle instead of carrying two rows of seeds, one row on each of its two margins, has them reduced to one seed only, then the carpel is reduced also and fits this one seed like a tightly fitting skin. Thus the achene of the buttercup is formed.

All sorts of reductions occur. Thus from the *Nigella*, with five coherent carpels forming a capsule, each containing many seeds, we may pass to the fruit of the apple, with only two pips in each. Again, the five carpels may be and often are reduced to two, as in snapdragon, with many seeds in each. Lastly, these two coherent carpels may contain only two seeds in each, and this is the case with all Labiates, as the deadnettle, and in the borage family. One would think that, as no flower of a labiate or of this last-named family contains more than *four* seeds, while every flower of the *Scrophularineæ* has hundreds, that this family would be much more abundant than the former, but it has really a less number of species!

Fleshy Fruits.—We have seen how a peach is obtained from a pod, and how the receptacle supplies the succulent part of a strawberry and of an apple. What advantage these juicy structures may furnish the seed when it grows it is not easy to say, as the seed itself is well provided with nutriment for the embryo; but it is of use in some cases as a means of dispersal in supplying birds with food. The seeds often have a stony protection, as in ivy, hawthorn, grape, gooseberry and currant, &c. This resists decomposition in the digestive canal, and so the embryo remains uninjured.

Aids to Dispersion.—Besides that already mentioned, many fruits and seeds are provided with special structures, which are more or less efficient in expelling and distributing the seeds; but most plants are unprovided with them. The following may be taken as illustrations—achenes with "tails":—In *Clematis* and some anemones, the style develops into a long hairy tail, giving the name "old man's beard" to our common traveller's joy (*C. Vitalba*). In some fruits and seeds "wings" are developed as they ripen. This is called a "samara" in the fruit of the maple, ash, elm and birch. In the Scotch fir, it is the seed which bears it, but in many other species of pine there is none at all. In the winter cherry (*Physalis*) the calyx forms a large bladdery covering, and when this falls it is rolled along by the wind, and ultimately the berry-like fruit within it decays and the seeds germinate.

In some few cases, as in the so-called "rose of Jericho," a small member of the crucifer family and nothing to do with roses, the whole plant dries up, is torn out of the sand and coils up like a ball. This is rolled across the desert, and when it reaches a moist place the pods burst and liberate their seeds. It is common to the east of Port Said.

Some fruits and seeds are provided with tufts of hair. Thus the fruit of the dandelion, goats'-beard, thistles and valerian are provided with a hairy or feathery "pappus," really constructed out of the calyx; but numerous composites have none, and yet are as widely dispersed and often commoner than those so aided. Thus daisies on a lawn may be more numerous than dandelions in waste places and in meadows. The seeds of willow-herbs, willows and many other plants, have tufts of hairs growing from some point, or else all over it, as in cotton. It is interesting to take a long pod of any willow-herb just ripened and remove the valves; it will be seen how the silky hairs on each seed immediately spread out when the pressure is released. They thus push themselves and each other out of the pod. In the reed-mace (sometimes but erroneously called bullrush) if they are gathered too late and nearly ripe, it will be seen that the fruits are supported on slender stalks carrying long bristles upon them; these soon spread out, and so by driving one another about, if there be a puff of wind a room will soon get full of the "down!"

It would be impossible to describe in a short article all the

various methods of aiding the expulsion and dispersal of seeds, but my object is to induce the reader to examine any or every fruit he can find when it is just "going to seed," and he will be pretty sure to discover many little contrivances for the purpose of expulsion. Look at the elastic valves of spurges, the slippery scales of the involucres of Centaureas, "hard-heads," the "pores" of snapdragons and toadflax, the recurved "teeth" in pinks, primroses, &c. Notice the reflexed involucre of dandelions, allowing for the escape of the pappus; the anchor-like teeth on the ovary of the same; the pod of the mignonette, *open* before it is ripe, &c., &c., and you will soon have plenty of observations wherewith to fill your note-book.

THE REGENERATION OF THE NEW FOREST.

SIR,—In your numbers for April and May, 1899, you deal with a matter of extreme importance to the public, namely, the preservation of the ancient woods of New Forest; and in so doing, state that the question arises whether it is not essential in the interests of the nation that parts of the Forest should be from time to time enclosed, to permit regeneration.

I imagine from your words that you have not intimate personal acquaintance with New Forest, for you do not mention that thousands of acres have already been enclosed since 1851, planted and managed on alleged scientific methods. How far those enclosures have advanced the beauty of the Forest up to the present time, or are likely to do so in the future, a very short visit would enable you to judge.

But the material point to which I wish to draw your attention, and that of the readers of NATURE NOTES, is this. As a fact, capable of absolute proof, the beautiful old woods, ancestral glories of England, are, without enclosure, of their own strength perpetuating themselves. Thousands on thousands of vigorous seedlings are rising up wherever there is open air for them to breathe, and brambles and thorn-bush for their protection. The fear is rather that these young seedlings should come up so thickly as to create jungle rather than forest. Under the grand old beeches, with their interlacing net-work of branches and thick canopy of foliage, it is by Nature's law that not a young tree can be found; the shade of the oaks even hinders the germination of seedlings.

But here and there the giants of old decay and fall, from age or tempest, and in a few years the open spaces so made are filled up with brambles and thorns, which in their maturity act as nurses to the successors of the old trees that have departed. Meanwhile around the margins of the deep shade, wherever such a nurse can be found, spring up thriving young oak, beech and

birch, the last not the least of the ornaments of the forest. We cannot expect to have the old woods keeping the same outline for ever, and always to be the exact same bit of forest, as if carved in stone, instead of being creatures instinct with life and subject to the incidents which belong to life.

But there will always be the representatives of ages past, if man will allow Nature to do her own work in her own way and in her own time. Hurry is the mark of our times, and Nature is too steady and slow for our scientific foresters, who, besides making the enclosures what they are, seem to think that planting trees here and there in the open, eight or ten feet high, is a more speedy way of getting effect than caring for Nature's seedlings. So every year the scythe is used to cut fern wherever any grows in or near the old woods, and those who may be in the forest in September or October can with their own eyes see thousands of young trees in the butts of the fern swathes, which are carried away from the forest for litter.

This is no work of the Commoners: they have no right to fern, unless they purchase it of the Crown, and all that is required is an order from those in forest authority to stop this wasteful process. Large quantities of fern are available for sale by the Crown, which can be cut without serious damage to rising timber; but no such destruction should be allowed in or near the old woods. I hope that you will be able to find room for this paper. It may induce some lovers of Nature to come to the forest and make notes of Nature, and to furnish valuable contributions to NATURE NOTES.

May, 1899. A SELBORNIAN.

BATRACHIANS AS PETS.

THE great number of notes on frogs and toads appearing regularly in NATURE NOTES has caused me to think that the following methods of keeping reptiles and batrachians in captivity, being the outcome of several years' experience, will be of general interest. All the animals here considered are easily obtained, and may either be captured by searching in suitable situations, or purchased for a trifle at the shops of dealers in gold fish and aquarium requisites. They all live on the animal food to be found in every garden, such as earthworms, slugs, and beetles, which must be given to them alive. In cold weather they will remain torpid for days together, requiring no food at all. I need hardly add they are all absolutely harmless. They will well repay the student who directs his attention towards them, as he need only provide the simple food already mentioned, with a dish of water to bathe in, a little gravel to crawl about on, and a broken flower-pot as a shelter from sun and rain. Moreover, if kept out of doors, as I shall describe, their habits can be studied as readily as if they were free.

I have myself employed for a long time one of the areas used in many houses to admit light to the cellar windows. This area is freely open to the air above, yet from its depth affords shelter from sun and wind. A deep layer of moist gravel forms a natural carpet for the inmates to crawl about on and a hiding place for the worms as a temporary refuge. In the centre of the gravel is a deep pie dish, full of water, affording free swimming room for the animals, and ornamental rockwork may be placed with advantage round the dish to permit ready access to the water, the edge of the pie dish being raised about an inch above the surface of the gravel to prevent the animals from sweeping gravel into the dish when they enter the water. It is equally important to place a piece of slate to form a sloping gangway for animals wanting to leave the water, as I have found even such active swimmers as young frogs drowned in the water, having become exhausted by useless attempts to climb the slippery sides of the dish. A large stone or flat piece of slate is placed in one corner so that the animals may creep under for shelter from the rain. I have also used an old flower-pot with a piece broken out of the rim, and have often on lifting it found underneath a happy family of toads and newts, harmoniously blended into one contented, sprawling mass. Mustard and cress freely sown gives a fresh green appearance for a time, but soon grows yellow and dies, affording even in decay food for the slugs thrown in from time to time to feed the frogs. Galvanised wire netting stretched over the top keeps the area free from dead leaves, bits of paper and other rubbish thrown in from the road, while allowing for free circulation of air at the same time.

In this place I kept for a considerable time a number of animals, comprising common and natterjack toads, frogs, tritons, and smooth newts. They were fed on earthworms which were thrown in at intervals. The worms burrowed into the gravel but came up at night and were caught. Gnats and spiders also strayed in from outside and were snapped up. The above method will be found excellent for studying frogs and toads, as the animals can be readily observed through the glass window as the observer stands in the cellar. They are effectually imprisoned while at the same time living in the open air with the natural alternations of sun and rain. In winter they may be taken in and allowed to hibernate. I add a few notes on particular species.

Triton cristatus (great water newt). May be captured with a net or purchased at a dealer's for a few pence. The male in spring, with his crest and bright orange abdomen, is a handsome fellow. Unfortunately apt to attack smaller newts.

Lissotriton punctatus (smooth newt). Widely distributed in fresh or stagnant water; thus I have observed it in running water at Col Fen, Cambridge, and again in a small wayside pond at Fairhaven, on the Lancashire coast. The best way of taking

them is by using a scoop of perforated zinc attached to a stout stick. This is plunged boldly into the water and thrust into the vegetation and mud. On lifting the scoop on the bank the water runs off rapidly through the holes in the zinc, leaving a number of wriggling animals for inspection. The scoop, if well made, is better than a net and saves time by allowing the water to drain off more rapidly and can be quickly inspected, whereas a net must be carefully opened out fold by fold to avoid missing anything. At Plumbley in Cheshire, on April 4, 1896, I remember taking an interesting series of newts, larvæ by this method, the gills still persisting whilst the orange colour of the perfect animal was already appearing on the abdomen.

Rana temporaria (common frog). In summer obtained easily enough by systematically walking along banks of streams and ponds, and occasionally striking the long damp grass with a stick. In winter taken with more difficulty by using scoop, thrust into the mud at the bottom of ponds and streams. A curious instance of a frog biting a common toad, apparently in revenge for the loss of a worm swallowed by the toad, has been detailed by me in *The Zoologist* for 1898. Frogs will eat almost any insect. In 1891 I removed the larva of a tortoiseshell butterfly, spiny as this insect is, from the stomach of a frog, when dissecting in the Owens College Biological Laboratory. I have found frogs to be expert climbers, as mentioned by correspondents in NATURE NOTES.

Bufo calamita (natterjack). This handsome toad, readily distinguished by the bright yellow vertebral stripe on the back, is found in drier situations than the common toad. It runs well, and avoids water as a rule. My own specimens would climb out when pushed in. May be obtained on sandhills near the coast, as at Lytham in Lancashire.

Bufo vulgaris (common toad). To be obtained in almost any numbers in March and April, and will eat almost anything.

GRAHAM RENSHAW.

NOTES ON BIRD LIFE AT THE GROVE. GREAT STANMORE.

A DRY autumn following an abnormally dry summer had the effect of lowering the ponds and reservoir in this neighbourhood to such a degree as to leave all around the margin a belt of mud and slime. This state of things attracted many of the wading birds, for in the mud they find all sorts of tempting morsels in the form of various species of mollusca which are then accessible to their long beaks. Dabchicks, coots, moorhen, teal and wigeon have been very plentiful here during the winter, whilst an unusually large number of herons have fared sumptuously upon the large fresh-water mussels. At the Elstree reservoir basketsful of mussel shells

could have been picked up, and they were also to be found lying about in the adjacent fields where the herons have carried them to enjoy their contents undisturbed.

Amongst the rooks here are several of a most pugnacious disposition: they watch the herons, and often when one flies off by itself these rooks persecute and mob it unmercifully. So far as I have observed, the heron rarely attempts to retaliate with its bayonet-like bill. Several newspapers lately have been lamenting the disappearance of the kingfisher from our streams and lakes. It is not quite extinct in this neighbourhood, I am happy to say. One has been seen several times this winter both here and at a lake in an adjoining estate. It is little wonder that these birds are becoming rare, for they afford an irresistible temptation to the greedy gunner. I was grieved to see in one cottage alone, no fewer than fifteen stuffed kingfishers under glass shades—a truly mortifying sight to a naturalist.

The bright-plumaged jay has increased considerably on this estate during the last few years; this, I think, is attributable to the growth of young trees on Stanmore common. Jays love to flit about in small thickets, and these they find on our common, since within the last ten years the furze having been nearly destroyed by constant fires, groves of birch-trees have replaced it, and have turned the common into a wooded heath.

A few peewits (lapwings) are always to be seen on the ploughed land of this farm, never more at a time than seven or eight pairs, and yet within a short distance nearer the reservoir these birds congregated by thousands during the past winter, the brown ploughed ground being a dappled grey colour with the multitudes of busy insect-hunting peewits. They are very shy, and if one attempts to get too close to them they rise and wheel round and round in a most graceful manner, settling again at some little distance. Occasionally they go off to the side of the reservoir, but the ploughed fields are their favourite haunts, where their incessant cries remind me very much of the flocks of sea-fowl on the open fields of the Channel Islands and the rocky islets of the Scillies.

A mild winter such as we have experienced (1898-99) is always associated with large flocks of wild duck. Ever since last November the lakes here have been alive with mallard and wild duck. In the early evening their cries, with those of the coots and moorhens, recalled the lonely fen country rather than a quiet piece of water within twelve miles of the Marble Arch. Last summer we missed from the farm-pond, where he lived in company with two domestic but dusky wives of the same variety, a fine East Indian drake. As we had on one or two occasions discovered a fox lurking about round the edges of the water, we naturally thought that he had taken the drake. I was, however, considerably surprised one evening, while watching the birds at the largest piece of water, to see this drake in company with four or five brown wild ducks, paying them all

possible attention. It must be added that they seemed quite willing to accept the favour of his company. Thinking that I could perhaps reclaim him and possibly even make him ashamed of his heartless conduct, I had his two wives taken from the farm-pond down to the lake. The result was curious. First, as was natural, away flew the wild ducks. Then I expected to see the drake fraternise with his legitimate partners. Whether he would have done so or no will never be known, for his wives would have nothing to say to him: they treated him as if they had never set eyes on him before, and, turning their backs, they made their way up to the farm with such haste that they actually arrived there before we did. Thus repulsed from the domestic pond, the drake determined to stay where he was. He was soon taken back into the confidence of the wild ducks, and he now flies as vigorously as they do. What his relation to the wild drakes may be I cannot say, but they certainly tolerate him, or else he would before now have been driven away from the lake.

Redwings and fieldfares have been very numerous this winter, one reason for this having probably been the large quantity of haws remaining on the hedges. These were especially noticeable during November and December, when numbers of blackbirds and song-thrushes might be seen feeding upon them in the hedgerows.

Several years ago woodcock were to be seen both on the common and in the hollow by the lake. Last year I saw a woodcock twice; this winter I have not even heard of one. They are of course very shy and almost nocturnal in their habits, but I am afraid they are forsaking this place.

A few snipe have frequented the smaller lake here and the county ditch, and on one occasion, early in the winter, eight common gulls were put up from a field on the farm.

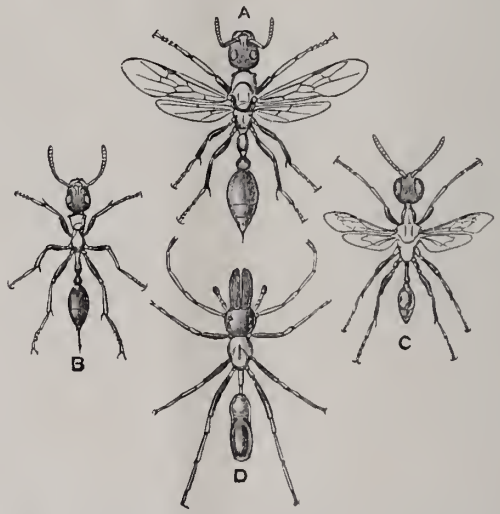
It is cheering to find that one result of bird-protection afforded in this place is the increase in the number of woodpeckers. The laughing cry of the green woodpecker is to be heard throughout the year in all directions, and this spring the lesser spotted woodpecker is nesting in several places in the gardens. One old tree-stem has nine holes made by this bird, in one of which I believe a nest may very likely be formed. In the early morning one may watch this tropical-looking bird busily engaged either in searching for insects or chiselling holes in the rotten tree-stems which it selects for its operations. In one case the breeding-hole is only five feet from the ground and a gravel walk is near by, so that if the bird continues as fearless as it now is it may be possible to observe something of its habits during the nesting season.

J. W. Odell.

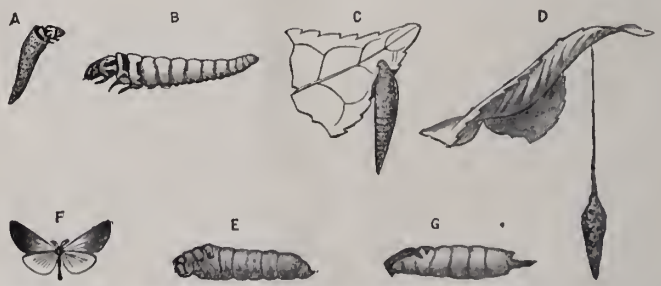
REVIEWS AND EXCHANGES.

The Cambridge Natural History, vol. vi. *Insects*, part ii. By David Sharp, M.A., M.B., F.R.S. Macmillan & Co. Price 17s. net.

Of all the ten projected volumes of this excellent series the present is the only one that cannot be called complete in itself. The class *Insecta* in general and the lower orders of the class were dealt with by Dr. Sharp in vol. vi., a work which may be said to have already taken rank as a classic, although only published in 1895. For the general reader that must necessarily be a more interesting

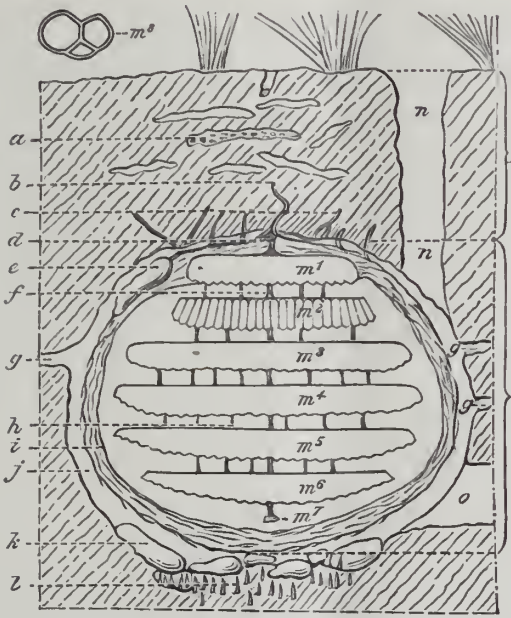


A, Winged female; B, Worker of ant (*Sima rufo-nigra*); C, Wasp; D, Spider, associated with the ant.

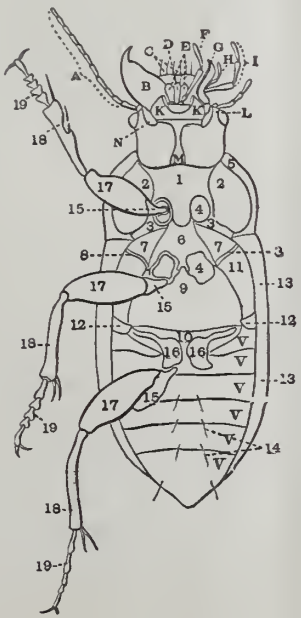


Metamorphosis of *Monda rhabdophora*.—A, larva in case, natural size; B, larva magnified; C, female pupa in case; D, male; E, female pupa magnified; F, male imago; G, female.

volume than the present, which, beginning in the middle of the Hymenoptera, is entirely occupied with the systematic description of the higher orders. Nevertheless, containing, as it does, the Aculeate Hymenoptera, Coleoptera, Lepidoptera, Diptera and Hemiptera, all described on the usefully comprehensive scale adopted throughout the series, the volume will be as indispensable to the real student of entomology as its predecessor. Nor is it by any means deficient in topics of the deepest import to the general biologist—topics which, though



SECTION OF SUBTERRANEAN WASP NEST (after Janet), with (*a*) nest of ant (*Lasius flavus*) above it; *l*, larvæ of fly placed in ground beneath the nest.



UNDER SURFACE OF BEETLE, *Harpalus*.—A, antenna; B, mandible: C, labrum; D, ligula; E, paraglossa; F, labial palp.; G, inner lobe of maxilla; H, outer lobe; I, maxillary palp.; K, mentum; L, gena; M, gula; N, buccal fissure; V, plates of ventral segments; 1, prosternum; 2, prosternal episternum; 3, prosternal epimeron 4, coxal cavities; 5, pronotum; 6, mesosternum; 7, mesosternal episternum; 8, mesosternal epimeron; 9, metasternum; 10, antecoxal piece; 11, metasternal episternum; 12, metasternal epimeron; 13, epipleuron: 14, ambulatory setæ; 15, trochanter; 16, posterior coxa; 17, femur; 18, tibia; 19, tarsus.

handled succinctly almost to baldness, cannot fail to be elucidated by the accurate statement of fact. Such topics include the typical structure and life-history of each of the larger groups, with the ever fresh marvel of metamorphosis, and the wonders of protective resemblance and symbiosis which are illustrated by the figures that we are able, by the courtesy of the publishers, to reproduce here. We have, on a former occasion, called attention to the works of M. Janet on ants and the various insects associated with them; and some of the cases in the Natural History Museum, Cromwell Road, will have familiarised many with resemblances such as those of the ants, wasp and spider in another of these illustrations. The case of the "basket worms," *Mouda*, the larvæ of Psychidæ, is peculiarly interesting. They sometimes resemble the shells of molluscs so closely that they have been sent to the British Museum as shells, whilst some of them feed on grass just like snails. The form here figured resembles the molluscan genus *Clausilia*, and it is worth remembering that this mollusc has in its turn a striking resemblance, not only in form but in the angle it makes with a twig, to the unopened buds of the beech. The volume comprise over 600 pages and nearly 300 illustrations, mostly original, the delicacy of which condones the weight of the volume.

Missouri Botanical Garden. Tenth Annual Report. St. Louis, Mo.

This volume—even more sumptuous than last year's issue—contains, with other matter, a biography, with a portrait, of Dr. E. L. Sturdevant, and "Notes on the Grasses in the Bernhardi Herbarium, collected by Thaddeus Haenke, and described by J. S. Presl" in "Reliquiæ Haenkeanæ," vol. i. (Prague, 1830, fol.), a scarce work, illustrated by new plates of nearly seventy of Presl's types.

Royal Society for the Prevention of Cruelty to Animals. Seventy-fifth Annual Report. Price, to non-subscribers, 1s.

This report shows steady progress in all the departments of the Society's work, though the appearance of their new journal is again indefinitely postponed.

The National Footpath Preservation Society: Fourteenth Annual Report, 1898-99. *Commons Preservation Society: Report*, 1897-98.

These two societies, which have done such valuable work in the past, are now—most wisely, as we think—amalgamated, the joint society being henceforth known as the Commons and Footpaths Preservation Society, the offices being at 1, Great College Street, Westminster, and Mr. L. W. Chubb being the Secretary. The formation of the Thames Preservation League, and the Parliamentary Amenities Committee, and the preservation of Churchyard Bottom Wood, Highgate, are among the topics alluded to in the second of these reports.

Report of the Kent and Surrey Committee of the Commons and Footpaths Preservation Society, 1898-99.

Though more local support, personal and financial, is much wanted, this committee has already accomplished a good deal. Croham Hurst and Ide Hill are among the cases discussed in this report.

Essex Naturalist, vol. xi., Nos. 1-3, January—March, 1899. Price 1s. 6d.

This part contains, with much other interesting county matter, an article by the editor, Mr. W. Cole, F.L.S., on "The Protection of Wild Birds in Essex."

Received.—*The Victorian Naturalist* for July and August; *The Naturalist*, *Irish Naturalist*, *Animals' Friend*, *Humanity*, *Animal World*, *Our Animal Friends*, *Science Gossip*, *Knowledge*, and *Agricultural Economist* for September.

NATURAL HISTORY NOTES AND QUERIES.

A Dog's Faithfulness and Sagacity.—The Rev. F. W. Thoyts sends the following to the *Reading Mercury*:—"Sir,—I take it for granted that most, if not all, of your readers are interested in the genus 'dog.' They treasure his affection, admire his sagacity, love him as a friend, and will agree with the poet Byron, who writes thus of a dog—'Denied in heaven the soul he had on earth.'

"Many stories about dogs are extant. We hear and read of them with wonder and amusement. I have heard, and know it to be authentic, that a fox-terrier belonging to my father-in-law many years ago was taken from Cambridge into Lincolnshire in the boot of a coach. The dog disappeared, and was found

soon afterwards seeking admission to my father-in-law's rooms at Cambridge. Sagacious, to say the least of it; but how did he find his way, as he had never been that road before except in the boot of the coach?

"Now let me tell the story of a St. Bernard. I am staying at the Hotel des Trois Couronnes at Vevey, on the Lake of Geneva. On July 19, two gentlemen came to this hotel, and in the evening we had an excitement over the arrival by the late boat of a St. Bernard, named Bari, belonging to one of them. His master had come by an earlier boat from the Hotel National at Geneva, but as Bari had gone to bathe he was obliged to come later. He is a beauty, with such a head, and such a lovely smile. I may also mention that he is a grandson of the great Bari, who saved so many lives near the Hospice of the Great St. Bernard. Little did I think on first acquaintance that very soon young Bari's faculties would be put to the test.

"On Saturday last, July 22, Bari's master went to Ouchy, the port of Lausanne, by the 3.30 p.m. boat from here, and Bari was left on the landing-stage in charge of a man. He struggled to get loose, and the last thing his master saw was the dog free. In the evening when his master came back from Ouchy, Bari was nowhere to be found. The matter was put into the hands of the police, and a visit paid to the railway station, and it was found that Bari had been there in the course of the afternoon. Now mark the sequel.

"Having searched Vevey over for his master, Bari went on board the steamer at 6.55, and in it went to Ouchy. He searched the hotel there, where his master had been staying, and then went up to Lausanne, where he had also stayed, and in Lausanne he was seen by a boy, who knew him, and tried to catch him. On Sunday, July 23, a telegram came here from the Hotel National at Geneva, to say that Bari had arrived there, and was safe at the place he came from last week. How did he get to Geneva? He went on the 4.50 p.m. boat from Ouchy to Geneva, and when he saw the Hotel National from the steamer he jumped overboard and swam ashore. This is proved by the utter state of collapse in which the poor thing arrived; almost drowned. I believe the distance he swam was nearly a mile, for the steamer runs far away from the hotel when making for the harbour at Geneva.

"Such is the marvellous story of Bari's search for his master. Not often does a story like this come under one's own ken. It must interest many. I can only feel, and others must with me, what marvellous power God has given to what we call the lower grade of creation, 'the brute.' What love, what affection, what sagacity, what perseverance! Is man up to such a mark always?

"P.S.—I may mention that Vevey is some fifty miles from Geneva, so Bari hunted over three towns, travelled by two steamers, and swam a very long distance, alone and fasting. No wonder he collapsed, but at last he reached the Hotel National where his master had stayed for some time, and threw himself at the feet of a boy who had had care of him."

Moles.—Moles are far too common in this highly preserved district, where amongst their other enemies foxes and weasels are rare. Farmers do not take the trouble to keep them in check; and the old-fashioned mole-catcher is well nigh extinct. This dry season, however, has already decimated their ranks. Not being able to find sufficient food in the parched fields, they frequent the sides of ditches and such like places. There is a lane here the banks of which seem to be the mole's *dernier ressort*, where I have seen them lying dead in numbers. The love of my garden militates somewhat against any regard for the mole's good qualities; for a more troublesome creature among our pet plants, or one harder to get rid of, I do not know. A trap is almost useless in deeply trenched ground when the earth is dry. If a mole once springs a trap he will not enter it a second time. EDMUND THOS. DAUBENY.

Market Weston Rectory, Thetford, Norfolk, August 16, 1899.

Birds Singing at Night.—In reply to "Lucy Rowlatt" on page 179, I cannot make it out by the description of a "short but sweet song." The birds which most frequently sing at night here are the nightingales, sedge warblers, hedge-accentors, cuckoos, sometimes an occasional thrush, and at dawn, swallows, skylarks and robins in rotation.

The Wren's Nest, Astwood Bank. J. HIAM.

Cuckoos.—Those readers who have taken an interest in the so-called cuckoo "myth," and may not have seen *Feathered World* for the past few weeks,

may be interested to know that photographs have been taken this season of the birds in the very act of ousting their fellows, as I have repeatedly seen it carried out. JAMES HIAM.

It may be of some interest to record that yesterday evening, September 2, I saw a cuckoo flying in the grounds of the Queen's Cottage, Kew Gardens. The flight and the hawk-like tail are not easily mistaken; and as my companion, who first saw the bird, was Mr. W. H. Hudson, there was no risk of error in the observation.

Last year at Kew, in the early mornings of September 1 and 3, I heard the call of the cuckoo; and in your October NATURE NOTES for last year you say that a Bideford correspondent tells of the cuckoo having been heard there on September 4. These facts show that there is not the imperativeness one used to fancy in the old lines :—

"In August
Go he must." EMMA HUBBARD.

Swallow.—On August 18 I noticed a swallow, a young one, the tail feathers not fully grown. Its colour was that of a canary, pale yellow or soiled white and green. It seemed one of a family of three swallows, all not long flown. As it sat for some time on a ledge of a window I had a good view of it. It afterwards skimmed about on the lawn catching flies, and was in every other respect, colour excepted, a young swallow. I should be glad to know whether such a thing has been often seen before?

Castle Cary, Londonderry, Ireland, Aug. 25, 1899. MAJOR.

Birds and Fruit Buds.—"Verax" on page 151 refers to the damage done by birds taking the fruit buds, which I can quite understand from personal experience, and from the number of letters I annually receive asking for advice. I have no doubt the bulk of the damage is done by *bullfinches* in orchards, fruit plantations, and standard trees, but for bush fruits, gooseberries and red and white currants, house-sparrows are equally responsible. My observations are that innocent birds are often accused in the press. I have explained to "Verax" "what kinds of birds are responsible for the damage." Now, as to "what is to be done," I advise, as I have often done before, trapping bullfinches in cages, commencing at once, as I have done. Last season about seventy—within one, more or less—placed themselves in confinement in my garden. This means probably tons of fruit saved in the locality, and at same time prevented an enormous accumulation of birds being bred in the district. Better, in my opinion, to save the birds' lives for pets than shooting—their usual fate.

Astwood Bank, Redditch. JAMES HIAM.

Dropped Eggs.—Several dropped swans' eggs were found about the park at my home this last spring (May). A pair of swans were nesting on an island in the lake. Swans being anything but timid birds, it could hardly have been sudden fright that made them drop their eggs. Is finding dropped swans' eggs a common occurrence, and what is the explanation likely to be?

Grey Friars, Dunwich, Suffolk. MARY BARNE.

The Viper in Berkshire.—Would any Berkshire reader of NATURE NOTES kindly inform me whether the viper, otherwise known as the adder, occurs commonly in any part of the Royal county? I have never met with it in this part of North Berks.

Fyfield, near Abingdon. W. H. WARNER.

Bees.—Hereabouts there has been a scarcity of swarms this year. Four out of my six hives have not swarmed at all, and so it is with my neighbours. What can be the reason? Did the spring, by causing activity in the hives at an unduly early time, create an unusual demand upon their stores before the bees could replenish them, and reduce their numbers by starvation?

EDMUND THOS. DAUBENY.

Cabbage Butterflies.—Cabbage butterflies, especially the small cabbage, are very plentiful, so much so as to be remarked upon by those who are not generally observant in such matters. Our cabbages are sure to pay the piper. Few insect pests, however, are abundant two years in succession. The great crop of these butterflies is sure to cause a corresponding increase of their enemies, ichneumon-flies especially, which will probably gain the upper hand and reduce their ranks next year.

Market Weston, Thetford, August 1, 1899. EDMUND THOS. DAUBENY.

Humming-Bird Hawk-Moth.—This interesting insect has been much *en evidence* lately, paying assiduous attention to the geraniums. I was much interested to-day, as he flew into my bedroom and plunged his long proboscis into the centre of a pink pelargonium which was in a vase by my side. I have always noticed their preference for geraniums. It struck me as interesting that the moth should have detected a solitary geranium in an upper room. It paid no attention to the other flowers in the vase.

Foxton, Cambs., September 8. A. M. G.

[We have received similar intimations from several different districts, and have ourselves seen a good many examples of this beautiful insect on spur valerian at Vire, Calvados. Its abundance is probably due to the dry hot summer. Many years ago we observed it in scores on a bed of petunias.—ED. *N.N.*]

White Spider.—As I see my query anent a white spider has been inserted in NATURE NOTES, I conclude it is a rarity, and that possibly something more of the history of mine may interest your readers. After I had "him" a little time, I one morning found he had suddenly collapsed, and he looked so shrivelled and wretched that, as he had shown no eagerness for the food I had managed to catch for him, I thought he was starved and going to die, *or*, that a little tangle of web between two honeysuckle leaves (pinks were over) which he, or perhaps rather "she," persistently kept near, was the solution of the mystery. She lived for six weeks, and plumped up again somewhat, but three days ago she died, and this morning the mystery is solved by a swarm of wee greenish-grey spiders in the tumbler where I still kept the webby tangle. I shall try to rear my orphans on aphis or such like small deer.

Kent, August 12. E. K. HITCHCOCK.

It is a common occurrence for very pale-coloured spiders to take up their station in the bosom of attractive flowers, and seize any unsuspecting fly which comes to sip the nectar. They may frequently be seen in the blossom of the bramble. The proboscis of the fly is the part generally seized by the spider, which is often very considerably smaller than its victim. The spider described is no doubt common enough, but I may remark that a spider is not an insect.

Fyfield, near Abingdon. W. H. WARNER.

In answer to the query relating to white spiders, I have seen many of different sizes from time to time. They may readily be obtained by placing an inverted umbrella beneath a hawthorn hedge, and beating the hedge with a stick. They are not albinos, but the normal colouration of many species includes patches of white. Thus on August 3 of this year, at Dunham Massey, Cheshire, I observed a small spider, abdomen white faintly tinged with green, legs and cephalo-thorax greenish brown.

Sale, Manchester. GRAHAM RENSHAW.

Water Melon.—A few days ago I bought a water melon. It was to all appearance sound, but on cutting it open I found the seeds had begun to germinate. Some of the cotyledons had escaped from the testa. The hypocotyls were in some instances an inch and a half long. Both cotyledons and hypocotyls were pale green. The radicles were well developed and embedded in the endocarp. The flesh of the fruit was of the usual colour and texture except that it was very dry.

Is it usual for melon seeds to begin to grow while still within the fruit? Does the pericarp form a kind of hot-bed in which they are kept moist and warm and well fed until the young plants can support themselves? It seems possible that in their natural dry habitat the water collected by the parent fruit may be of great service to the young plants.

27, *Nassington Road, London, N.W.* L. E. ROBERTS.

["As a general rule, seeds do not germinate until they are separated from their parents; but in some cases, and more especially when invested by pulp, as in the gourds, melon, cucumber, papaw, &c., they do so before they are detached."—Bentley, "Manual of Botany," 2nd edition (1870), p. 790. This "viviparous germination," as it has been called, which is normal in the mangroves, frequently occurs in lemons. Your explanation is plausible.—ED. *N.N.*]

SELBORNE SOCIETY NOTICES.

The Council acknowledges, with thanks, the receipt of the following increased subscriptions:—Mr. and Mrs. F. Alfred Currey, 20s.; Miss F. Patteson, 10s.; P. Marsh, Esq., 10s. 6d.

Council Meetings.—The next meetings of the Council will be on October 3 and 17.

Croydon Branch.—The Council has received, with much regret, an intimation from Mr. E. A. Martin, F.G.S., that he feels obliged to resign the secretaryship of this branch at Christmas. They will be glad, therefore, to hear of any one who is willing to undertake the post.

Field Club Rambles:—

July 18.—Betchworth and the Buckland Hills. The party, numbering twelve, arrived at Betchworth by a train which was an hour late, and were, therefore, unable to climb Betchworth Clumps (700 feet); but after tea at the Red Lion, Buckland, they ascended the Buckland Hills (400 feet), and, after collecting many characteristic plants of the chalk and enjoying the extensive view and a fine sunset, took a woodland path to Walton Heath and thence returned by Pebble Hill. Total distance, six miles.

July 29.—Potter's Bar, North and South Mimms. From Potter's Bar Station at 3.15 p.m., field paths were taken to South Mimms, where the church was inspected. The party then walked through the park to North Mimms, where the Rev. Mr. Batty very kindly gave them tea. After being shown over North Mimms Church they returned by bye-roads and field-paths to Potter's Bar by 9.10, having observed several interesting plants *en route*.

September 9.—Titsey Hill. From Woldingham station a path was taken to the top of the hill where a fine view was obtained to the north-west, as far, at least, as Wimbledon. The road to Titsey Hill afforded the grander panorama of the weald across to East Grinstead. Following the ancient "Pilgrim Way," between hedges laden with blackberries, Botley (860 feet), the second highest point in Surrey, was reached by 6 p.m., as arranged. After an *al fresco* tea at Botley Cottage, the guide, Mr. M. Mühlberg, conducted the party down a steep chalky lane through Titsey Woods, where *Atropa Belladonna* in fruit and abundance of sweet briar were noticed, and so to Oxted station.

Swiney Lectures on Geology.—Dr. R. H. Traquair, F.R.S., will deliver twelve free lectures on Pleistocene Mammalia, at the Jermyn Street Museum, on Mondays, Wednesdays and Fridays, October 2—27, at 5 p.m.

ANSWERS TO CORRESPONDENTS.

S. P. Hawes.—The circumnutation of growing shoots will explain the twisting together of the two stems of *Antirrhinum*. *Maurandia* clambers by twisted petioles and peduncles.

Lilly Hargrave.—*Berberis* (*Mahonia*) *Aquifolium*, the American Holly. The berries are edible, but I doubt whether they are worth making into jam. The plant, however, is valued for preserves, affording excellent cover for ground game.

E. M. Walker.—1 and 2. Next month. 3. *Rapistrum rugosum* All., a casual from Central or Southern Europe. 4. *Beta maritima* L.

Rev. A. H. Courthope.—Apparently an *Œnanthe*, but an insufficient specimen.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W. letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 119. NOVEMBER, 1899. Vol. X.

SELBORNIANA.

Our Winter Session.—As will be seen from the notice on the last pages of the present number, the Council have decided on a new departure—or rather two new departures—during this winter. Firstly, we are to have a series of evening lectures, which will, it is hoped, be monthly, on the third Tuesday in each month; and, secondly, a series of Saturday afternoon visits to places of natural history or archæological interest, kept as far as possible between the hours of 2 and 6 p.m. Obviously, if these plans are to be successful, members must support them by coming themselves and bringing their friends.

Death of Lord Farrer.—The cause of the preservation of the country in its old-time beauty and accessibility has sustained a severe loss in the death of Lord Farrer, which occurred suddenly at Abinger Hall on the 11th ult. Our Abinger Branch, of which she is a member, the Field Club and the Society generally will wish to express their sympathy with Lady Farrer in her bereavement.

Grebe.—A correspondent writes to enquire whether any cruelty attaches to the wearing of grebe, as it is now becoming very fashionable. We believe that, as the whole of the breast feathers are employed, the birds are killed outright, without the barbarous cruelty of tearing the wings off a live bird as in some other cases; but probably some are only wounded, and, as the bird is not plentiful, the fashion is, from our point of view, to say the least, regrettable.

Doves.—A lady will be glad to send a pair of doves to any one who can give them a comfortable home.—Address E. S. N., 4, Eldon Road, Hampstead.

FORESTRY AND AGRICULTURE.—We all know that our English-Scottish King was a great scholar, but I do not think it is generally known that he was a forester; so the following, taken from Schlich's "Manual of Forestry," vol. iv., "Forest Protection," by W. R. Fisher, will, I think, interest some of the readers of NATURE NOTES, and what is further said of the British gamekeeper's ways will also interest Selbornians.

At p. 3:—"In England, James the First was the first monarch who considered forest trees of more importance than game: he obtained much unpopularity by enclosing part of Windsor Forest, and put an end to the pollarding of maiden oak-trees, which were lopped in winter to enable the deer to browse off the bark of the lopped branches. None but pollard oak have been lopped in this way since 1608, and most of the hollow old oak pollards in Windsor Forest were in existence before that date. . . . . Rabbits have increased in the most alarming manner during the last twenty years, and have destroyed the valuable undergrowth over large areas of the forest. They render the reproduction of the trees exceedingly difficult and expensive, and altogether nullify the proper management of the large area of oak forest planted for the nation in 1816-25. Such wholesale destruction of valuable woods by rabbits would not be allowed in any other European Crown forest. . . . .

"The preservation of birds useful in forestry and agriculture has been furthered by the naturalists of different European countries and by the enactment of special laws. At the same time the British gamekeeper, by indiscriminately destroying birds of prey and the smaller carnivora, has allowed rabbits and wood pigeons to increase so enormously, so as to become a veritable scourge to forestry and agriculture, to say nothing of even greater damage from mice and voles."

GILES A. DAUBENY.

Gidley, Chagford, Dartmoor, June 2, 1899.

BROADLAND IN WINTER-TIME.

ACCORDING to the calendar it was spring, but judging by the weather it was winter surely enough. At any rate on March 26, 1899, two naturalists left Kings Lynn by a train timed to start at 8 a.m., and to arrive at one of the stations from which the Norfolk Broads are available, at something before eleven, but as a matter of fact the journey, which is approximately fifty miles, took nearer four hours than three, owing to the delays caused by the snow. A friend we met in the train, who once upon a time was connected with the Yorkshire Naturalists' Union, could not understand what was taking us to the Broads on such a day. Were we

fishing? No, we were not, although we had a well-worn botanical box which had carried fungi in various parts of the three kingdoms, to say nothing of foreign lands, during the last quarter of a century, and which looks like a hybrid between an angler's bait-can and a Brobdingnagian sandwich box. We tried to explain to our friend that our objects were birds and fungi. Had we told him the exact truth we should have said that "we were going to search for the *teleutospores* of the *Æcidium* on *Orchis latifolia*, which a gentleman in Germany has recently asserted are to be found on *Phalaris arundinacea*." This explanation reads right enough on paper, but in the bumping and thumping of a railway carriage would have required a considerable amount of elaboration, so we modified matters by saying that we were going to gather a plant. What, in all this snow? For at the part of the journey where this conversation took place the snow was half a foot deep. We pointed out that we were then between two and three hundred feet above the sea level, that the Broads were nearly at the sea level, and even if the worst came to the worst we should "dip" in the snow for the plant as Robinson Crusoe did in the sea when he over-turned his iron-laden raft in the days of our boyhood. Two stations from our destination it snowed so hard that you could not see a hundred yards in front of you, while on the ground it was ankle deep; but as the line descended the snow ceased to fall and less and less lay upon the ground. We ran the gauntlet of the boat-proprietor's questions as to our business; and, having secured a boat, "poled" out of the "dyke" through the narrow unfrozen channel in midstream, until we got fairly on the Broad itself, where both oars could be used. One of us rowed while the other shivered on the stern sheets covered up by all the greatcoats available. As we glided amongst last year's tall waving reeds, with a clear sky above and a bright sun in front, the quiet stillness made us feel as if we were in a very paradise of natural beauty. On the shallow margin a patch of whitish gray was soon descried; the stem had lost many of the lower leaves, but the palm-like cluster of leaves at the top showed us that the plant we were in search of would need no "dipping for." Before it could be gathered, however, we had to ship our oars and watch half a dozen coot, who were calmly swimming between the clusters of reeds, bobbing their heads with each stroke of their feet in true cootean style. By the speed with which they swam one would think properly webbed feet were quite unnecessary luxuries, while the sun shining on their backs made them look as black as the proverbial crow.

The Phalaris was duly examined and found to be abundantly flecked with tiny black dots, so a big bundle was carefully stowed away in the box for experimental purposes, and on we went.

As we rounded the corner of a reed bed another boat was seen approaching us, rowed by a woman, apparently a fenman's

wife, and in the stern surrounded by market baskets sat a typical daughter of the Broads. We could have fancied ourselves in Holland, had the East Anglian salute not disillusioned us.

We rowed on in silence till challenged by the monotonous double-note of a male reed-bunting, who sits, sentinel like, on a leafless alder bush, and does not forsake his post until we almost splash him with our oars.

Our next stoppage was to examine some stunted willows. Why are willows always stunted in descriptions of fen scenery? We are not responsible for what other people write, but in this instance the willows were stunted because they were attacked by a parasitic fungus—a fungus which now rejoices in the name of *Cryptomyces aureus*, but which was figured by Sowerby a century ago under the name of *Sphæria aurea*. It is a beautiful fungus, making the affected twigs look as if melted pitch had been scattered over them, only the black shining spots are surrounded by brilliant golden yellow borders. After a time, however, the black centre breaks up, and the branch, denuded of its bark and dead half way through, shows what a terrible enemy to a plant a parasitic fungus can be. But what is that noise in the reeds? What bird is it? Is it a bird at all? No, it must be the bark of an otter! Can it be so at this time of day? Whatever it be we cannot get nearer it, so its identity has to remain an unsolved problem. But look to the right at that water-hen (which is most likely a cock) and then to the left at those coots—see the difference? There far away in the distance is a kestrel hovering over the fields which come up to the edge of the Broad, while across the Broad itself a heron lazily flaps its way to settle down on the shallow margin. Our binoculars are so fully employed that we scarcely notice the "big bits and little bits of white fluff," as a three-year-old young lady, a friend of ours, a native of the Transvaal, called the first snowflakes she saw. An extensive reed bed, half a mile away, appears to offer some protection from the storm, but long before we reach it the snow has ceased. As we row we look upwards to the fast clearing sky, and there are three quacking wild ducks with their necks stretched straight out as if they intended their heads should arrive at the coveted feeding ground well in advance of their bodies.

The Broad is as smooth as a sheet of glass as we row over acres of water-soldiers (*Stratiotes*), now all safely hidden away on the muddy bottom. We see in the far distance a church-tower mirrored upside down in the water, while half way across is a wherry, one of those curious barge-like boats with an enormously tall mast, so that the proportionately huge main-sail may catch the slightest breeze above the reed-lined, willow-margined Broadland waterways. As it passes between us and the sun the square sail makes a parallelogram of blackness on the water. But churches and wherries are soon displaced from

our gaze by a metallic "ping-ping" from the reeds. The boat is allowed to drift while we watch within a short dozen yards a flock of bearded tits hunting the reed bed. As they hop from reed to reed these beautiful birds, with their blue-grey heads, their yellow beaks, their red-brown backs, and their long tails fairly hold us entranced. Look at that male bird with his orange bill and his grand black moustache! He has evidently taken our measure, for he seems to know we are neither pot-hunters nor poachers, but true Selbornians. Skipping from one reed to another, peeping into the crevices between the sheaths and the stems, he examines each for an instant, and then by a couple of strokes of his wings alights on the next stem; he looks up it and down it, and is off again, always parallel to the water and working a few inches above it. All the while he is "ping-pinging" as much as to say, "I am not the least afraid of you: I know I am protected by the County Council bye-laws: I am one of the rarities of the County, I am: I know you won't hurt me, but — birrrrrr — don't come any nearer, please." Then beside him alights a blue tit, with his brilliant colours glistening in the sun. See how he sidles up the reed on which he has alighted from bottom to top until he seems to make it bend. We wait and listen to the bearded tits calling to one another in the reeds as they work through the beds, until their voices get fainter and fainter in the distance. It is so like fairy-land that we have forgotten our fingers till they are stiff with cold. We turn our boat's head homewards and watch the blue smoke curling upwards from a dozen cottage chimneys belonging to a pretty little village which nestles beneath a belt of firs and alders on the margin of the Broad. The declining sun lights up the ruddy brick houses with their snow-covered roofs, while the columns of smoke bespeak the preparation of as many evening meals. Wistfully we leave this peaceful scene. A turn in the waterway shows us the moon is already far up in the heavens, only waiting for the departure of the sun to dominate the scene. In front of us we note the rapid flight of a snipe, while beside us the weird cry of a redshank causes us to stop and watch him as his red legs disappear in the shallow pool into which he has settled. The trumpeting of coots hidden away in reeds reminds us that we are near the spot at which we began our day's voyage. The ice that impeded us in the morning has all gone from the dyke, so we moor our boat and walk leisurely to the station. Of course our train is late, but what of that? How can we be happier than in watching from the station platform the final setting of the sun as it sinks like a ball of fire behind a bank of mist? The soft calm twilight of this changeable day has its stillness only broken by the stridulent call of the partridges in the next field, and the love song of the thrush in the trees; while across the sky the noiseless flitting of a barn-owl completes the picture of rural beauty.

CHARLES B. PLOWRIGHT, M.D.
CHARLES T. M. PLOWRIGHT.

OBSERVATIONS FOR YOUNG BOTANISTS.

XI.—The Origin of Species.

THE subject of this article has caused a great deal of discussion during the last forty years; but after all, it is not a very abstruse matter, if we go straight to Nature and study her ways of doing things.

Just as all human beings have undoubtedly descended from some common stock, but can be grouped into many races, so is it with plants. Thus we have a large number of "species" of buttercups, and we should infer that they had all descended from some common ancestor; but we cannot actually prove it, and the way we arrive at the belief is by an *accumulation of probabilities* till it amounts to a conviction or certainty. This is called inductive[1] evidence. As an example: it was formerly thought that the earth stood still while the sun went round it in twenty-four hours. Since, however, it is a much simpler thing for the earth to revolve on its axis, than the sun to travel 540,000,000 miles in twenty-four hours, to say nothing of all the stars, which must revolve at far greater distances and rates, we believe the former, but it cannot be otherwise "proved."

Now when comparatively few animals and plants were known, they seemed to be very distinct, and all were supposed to have been created just as they are. Explorations, however, soon brought to light hundreds of thousands, and species which seemed at first to be very distinct were found to be, so to say, linked together by intermediate forms, thus furnishing a graduated series from one clearly defined species to another as equally clearly defined, when considered apart. Not only is this a very common feature in both living animals and plants, but it is equally so among extinct fossil animals, such as shells. The inference was that the members of these series of creatures of the same kind, or "genus," had somehow been "evolved" one from another. While, therefore, successive generations resembled their parents by heredity, yet coupled with the family likeness, there appeared to be a power to vary more or less from it. How was this "Theory of Evolution" to be proved? First, by inductive evidence. Thus it strikes one as much more probable that the innumerable instances of transitions have thus arisen, than that each slight variation had required a separate act of creation. Secondly, we verify or prove the fact of this power to vary by cultivation. When wild plants are grown in a garden, we find that the seedlings vary on growing up to the adult stage, and these variations increase with succeeding generations, so that from one original common wild form we can get any number of cultivated "races," as in carrots, parsnips, wheats,

[1] A word derived from the Latin *in* and *duco*, "to lead in" or accumulate facts.

barleys, grapes, melons, pansies, sweet-peas, chrysanthemums, &c. Similarly in the animal kingdom, all the domesticated pigeons are derived from the wild blue rock pigeon: all our horses and ponies are derived from one kind; and similarly is it with the numerous breeds of sheep and oxen.

The next question is, what induces plants to change at all? When we look at blue-bells, heath, daisies, buttercups, marsh-marigolds and many other plants which grow in masses, we perceive no changes year after year. They remain the same in the wild state. If, however, they be cultivated, as the daisy and pansy have been, we know that the garden forms have become very different from the wild ones. We therefore conclude that a change of soil is one thing and a change of climate an additional aid.

Some experiments have well illustrated this fact. In arctic regions and in high alpine places, plants are dwarfed and have often very brilliantly coloured flowers. They possess, also, several other features, such as a dense woolly clothing in some cases, as in the familiar edelweiss. Now, such plants when cultivated in lowland regions often change very much—they grow tall, lose a good deal of their hair, and the minute structure of their foliage alters. Conversely, if plants usually growing in lowlands are planted on high mountain regions or within the arctic circle, they acquire the peculiarities of the native vegetation.

Again, if we examine aquatic flowering plants, they all have certain features in common, such as air-chambers in the stems and petioles, and the blades of the leaves are in many cases finely divided up, as in the water crowfoots, *Myriophyllum*, and water violet (*Hottonia palustris*). One is driven irresistibly to the conclusion that these and other peculiarities are simply the result of an aquatic life.

To take an opposite condition: in hot and arid deserts, as around Cairo, all sorts of plants have small leaves, rolled-up, densely hairy and covered with a waxy epidermis—provisions for preventing a loss of water during the greater part of the year when no rain falls. Another form is a fleshy, leafless stem with a thick skin, so that much water can be stored up; this occurs in Cactuses, Euphorbias and many other plants. As such features occur in plants of the deserts of America, Africa and Asia, we are again driven to the conclusion that such admirable adaptations to the conditions of life are simply the result of the powers of self-adaptation to its surroundings possessed by the plant itself. The final outcome are various structures which systematic botanists regard as "specific," "generic," or otherwise. All the above observations apply to the vegetative organs of plants—roots, stems and leaves.

We have already seen how the various forms of flowers appear to be adapted either to insect-, wind-, or self-fertilisation; and these adaptations have never come into existence, so

to say, in anticipation of their future uses, but are the actual results of the visits of insects in the first case, and the want of their stimulus in their absence in the others; the self-fertilised and wind-fertilised flowers being in most cases degraded forms. This may be well seen in the cleistogamous buds of the violet, which will be found beneath the leaves in summer time.

All, therefore, that is required to produce new varieties and thence new species, is that the seeds of a plant should be carried to a different locality, where the surrounding conditions are somewhat markedly in contrast with the previous ones in its original home. It has been observed by many botanists that if a plant is abundant in one particular place, varieties are always to be looked for on the confines of its geographical area, because the offspring find there more variable conditions. The power to vary is then called into action, and the organs change in conformity or adaptation to the new conditions of life. In this way aquatic plants have descended from terrestrial, while some of the former have re-acquired terrestrial habits.

It is by the great doctrine of evolution that we have a true interpretation of the "affinities" of plants, and the terms "species," "genera" and "orders" or families have a real meaning of community of descent, and are not merely terms to stand for groups of plants which happen to resemble one another more or less.

The student should now look out for coincidences, similarities of structure in different plants growing under the same conditions, and he will soon find innumerable corroborations to the foregoing remarks.

GEORGE HENSLOW.

EDITORS AND ANNOTATORS OF GILBERT WHITE'S "SELBORNE."

THE issue of a fresh edition of "The Natural History of Selborne" recalls to mind the various writers on natural history who have during the present century edited or annotated editions of this classical work. Very early in the century, in 1802, White's nephew, John White, superintended the production of an octavo edition, which he prefaced with that short account of Gilbert's life, which has been reprinted in nearly all succeeding editions. We missed, however, in this edition the "Antiquities," omitted, as we were informed, as being of but little interest to the general reader. When the quarto edition of 1813 was published the "Antiquities" were again found in their proper place, and the Naturalist's Calendar, which had appeared as a separate volume shortly after White's death, was incorporated in the work. The edition was annotated by John Mitford, whose notes also found

a place more than half a century later in Professor Bell's edition. Issued afresh in 1829 in Constable's Miscellany, this edition bore traces of Sir William Jardine's handiwork, although it was not till 1853 that Jardine lent himself seriously to the annotation of the work. In the meantime it had been annotated by Professor Rennie and the Rev. W. H. Herbert, by Jenyns, Jesse, by Blyth and Mudie, all of whom added largely to the work by their own numerous and lengthy remarks, many of which were, as it seems to me, quite unnecessary. Captain Thomas Brown added voluminous notes, his edition being reissued at least ten times by successive publishers. The carefully edited editions of Bennett, Harting, Ward, and Bell are among the best known of recent issues, that by the Rev. J. G. Wood having an enormous sale. Frank Buckland's edition has been republished over and over again, and seems now to be the one most in demand, although cheap reissues of Jardine's are frequently announced. Jefferies' introduction to an edition in Scott's Camelot Series should be noted as being of considerable interest and value. Burroughe's beautiful edition is fresh in the public mind, and now we have almost an *edition de luxe* from the hands of the late Grant Allen. Personally, I am glad to welcome an edition from his hands. The roll of editors would have been incomplete without him. Only such footnotes as are absolutely necessary here find a place: in fact, so far as can be seen at present, those which have appeared might with advantage have been amplified. They are essentially "business-like" notes, and I look forward to the publication of the editor's critical and biographical introduction to see in the edition the stamp of his own individuality. The work is clearly printed in large readable type, and it is very fully illustrated by Edmund H. New. The illustrations are in a quaint style, and consequently somewhat lacking in the beauty of completeness. Many will admire their quaintness, but to me it must be confessed that there is a great want of freedom in the drawing: the houses and churches are too stiff and hard, and fail to suggest the weathering of years of rain and storm upon their exposed outlines. "The Wakes" is illustrated from all points of view, as well as any object or place, in any way connected with White's life or work. The very incorrect folding view of Selborne which appeared in the original edition, and was reproduced by Jardine, appears on pp. 160-161, and for Mr. New's credit should have been mentioned as copied from the old engraving. The picture of the Zigzag is too quaint to be correct. As "The Wakes" differs in appearance in the various illustrations, I should have wished that the date which each represents had been inserted. That on page 43 show it as it originally stood. In the illustration entitled, "A Corner of White's House," the commencement of the tiled path is seen which formerly led to the summer-house in the garden. We look forward with pleasure to the completion of Grant Allen's edition of the work, expressing a hope at the same time that the Antiquities will not be omitted.

EDWARD A. MARTIN.

BIRDS AND INSECTS AS METEOROLOGISTS.

WE know that authors from the remotest times have often referred to the habits of members of the animal world as unerring indications of coming changes in the weather. Aratus, Hesiod, and Virgil are great authorities on this subject, if we search amongst classical authors: indeed, Virgil, judging from his frequent references to this matter, must have been little less than a White of Selborne in his close observations of the flights and warning notes of birds, and of the habits of bees and other insects.

There is every indication of what we may term a telepathic instinct in birds and animals, a kind of fore-knowledge of disturbances in their immediate surroundings, a fact which is especially noticeable before the occurrence of an earthquake or a thunderstorm, when a sense of indescribable terror seizes upon members of the animal world, causing them to utter unusual cries and to slink away into places of concealment. The reasons for this are probably to be found in the facts that sounds which may not reach the human ear are keenly heard by animals, and that they too observe changes in the state of the atmosphere which are not directly observed by human beings; mammals and birds having probably, besides, instinctive indications of coming dangers about which we know nothing.

The following are examples of Hesiod's remarks on the habits of birds, &c., in connection with agricultural operations:—The cry of the crane is the signal for ploughing, so that every preparation should be made beforehand, that the work may be begun at once. Before the swallow appears the vines should be pruned. When the snail (the "house carrier") leaves the earth and mounts the trees the sickles should be sharpened. When, about midsummer, the cicala sings in the trees, weary man must look for enjoyment, a rock to shelter him, and plenty of food and wine, for it will be too hot to work in the fields.

I think it will be interesting if I refer to a few instances bearing upon the subject as I find them in Virgil, who, in his works on agriculture and allied subjects, often considers the flights and warning notes of birds, &c., before he recommends the performance of certain acts of husbandry, since the success of many agricultural operations will depend upon the state of the weather directly following them, and who can foretell this so well as birds, insects or beasts? The modern farmer may laugh at Virgil's old world ways, and yet he may observe and note various things in nature with a view to his operations which are much on a par with the wisdom and forethought of the old Roman poet. How often do we hear someone exclaim, "I am not in the least superstitious," and then again the same person on another occasion will solemnly declare that "he knows some terrible calamity is about to happen, because some indescribable feeling tells him so."

We mortals, no doubt, have our inexplicable forebodings or instinctive feelings in many matters; they may mislead or guide us aright. On the other hand, birds and beasts have instincts and feelings which never mislead them, and in this respect they are superior to mortals. Even science in meteorological observations and forecasts errs as often as not, and it is extremely probable that signs which may be found in the animal world, if we only studied them more, will give the truest indications of the weather.

Virgil says that sea-gulls or divers flying swiftly from the sea and screaming, coots sporting on the land, and herons flying high above the clouds, will in each case indicate a coming wind. Showers are foretold by the habits of many mammals, birds, and insects. The following are examples:—Cranes quickly descend from their higher flights: cattle with extended nostrils sniff the air: swallows fly low over the waters, because the heavier atmosphere forces the insects on which they feed to the lower strata of air: frogs croak more loudly from their watery retreats: ants carry their eggs quickly to their innermost abodes: ravens on their return from their feeding grounds beat the air with their wings, make noises, and flock together: various sea fowls dip and sport in the water with increased energy: the crows utter harsh notes; and so on. If sunshine and fine weather are to follow after rain and to continue, Virgil remarks that the kingfishers will cease stretching their wings to sun themselves on the shore: the swine will desist from tossing straws about: owls on the setting of the sun will hoot more loudly: large birds will chase the smaller fry: the sea eagle will fly aloft in the clear air; and rooks will caw joyously about their nests. When rain or an east wind threatens, bees are observed to remain near their hives. Many writers, indeed, refer to this indisposition of bees to travel when rain threatens. I think the earliest mention of meteorological observers may be found in the following lines from the Georgics of Virgil, referring to bees:—

> Sunt, quibus ad portas cecidit custodia sorti;
> Inque vicem speculantur aquas et nubila cœli.

F. Coleman, B.A.

LIGHTNING.—II.

(*Continued from vol. ix., p.* 230.)

THE pleasant and interesting comments in the January number of Nature Notes on my former paper on lightning lead me to make a few further remarks on this subject. But before attempting a scientific explanation I must premise that I am just now located 1,200 feet upon Dartmoor, without books of reference, so that what I shall say will be very much open to criticism.

One of my brothers informs me that the Somersetshire elm was struck on January 6, 1865, and another brother tells me that he helped to cut it down, and, with the latter, I visited the vacant site last December.

Yet another brother, the Rev. E. T. Daubeny, who is a frequent contributor to these columns, wrote to me concerning this tree and others that had been struck :—

"I was at Cleeve at that particular time, and saw the elm tree in 'Eighteen acres.' The circumstances are as fresh in my memory as if they occurred but lately. I remember the elm was struck some way up, and a piece of bark blown away; then the electricity seemed to have jumped some feet, and taken out a larger piece of bark lower down.

"But the curious part remains for me to tell. The grass *all round* the tree was cut in furrows: these furrows branched, and ended with a hole as large as one's finger into the earth. If you could imagine a hole here and there round the tree, emitting water running in a stream, then joining a small river running *up* the slope of the grass to the tree trunk. Only, of course, rivers do not run up hill!

"I have often thought what this mischief in the grass could be. We hear that the return shock from the earth is the more dangerous, and is that which kills so many animals, sheep, oxen, &c., that take shelter under a tree that is struck.

"The destructive force of the lightning that struck the tree would seem to be expended on the tree itself, and the return shock may have caused the furrows and holes. I remember well seeing a vivid flash of lightning, for I was looking out of my dining-room window at the storm, which struck a poplar in an adjoining field here nine years ago. About a cartload of splinters were knocked out of the tree, which was struck three parts up; and a great explosion must have taken place at the lower part, where so much damage was done. Some pieces were hurled 150 yards—one piece as long and broad as my body. But there were no furrows or holes in the ground, like at the elm at Cleeve. The poplar soon showed signs of being mortally wounded, and, to my regret, was taken down.

"A little before that a large oak tree was struck five miles from here. It was *in situ* a year ago, but is split fearfully, most of the bark off, and only partially alive. I had no opportunity of seeing if there was any damage on the ground, like what occurred at Cleeve.

"In the middle of this village is a tree that was struck just before I came: there is a broad strip of bark cut out from 20 feet above the ground to the roots. I have seen similar cases to this last, but none of dates that I know, save those that I have enumerated."

These remarks of my brother explain much; I may add, however, that it is positive electricity that descends from the clouds, and negative that rises from the earth to meet it.

Now when the tree that has become the victim of this union is straight in the stem, and is a good conductor of electricity, the descending positive electricity (which I believe to be the more active of the two) will reach the earth before the negative electricity has ascended the tree. This was the case of the tall pine, where I think the electricity passed down the tree just under the bark, where the circulation of the sap is active.

But when there are obstructions to the passage of the fluid, as in the case of the gnarled oak, the branching elm, or the deodara mentioned by Mr. Hubbard, the union of the two currents in the central part of the trees causes the "explosions" or equivalent phenomena mentioned.

The palm tree spoken of by Mr. Vickers needs special explanation. Trees, as a rule, grow in the broadening of their stems by means of a layer of wood being put on under the bark annually, but the palm is an exception; it expands from the centre. The wood of the palm is very fibrous, and is probably an indifferent conductor of electricity: the branching head is also a hindrance to the passage of the electric fluid. Yet this tree was struck, being tall and solitary. I cannot think the iron band or nail theory of any weight in absence of further evidence. Palms have no bark proper, and it may be, in their case, the electric fluid would pass down the centre of the tree.

I think trees are only struck by lightning coming down in a perpendicular direction. The current we see wobbles a bit—it is not jagged, as it used to be represented in pictures: photography has corrected that—this being due, I take it, to uneven obstruction or wind in the atmosphere. I can quite imagine it *may* be otherwise in high mountainous regions, where an electrically-charged cloud, lying below the mountain tops, may perhaps strike out right and left to earth; but I have never *seen* this in storms in the Swiss mountains.

Electricity, passing from cloud to cloud charged with different electricities, to my mind explains horizontal and slanting lightning, and beyond the distant horizon refraction may make the flash to appear somewhat deflected. But near lightning coming to earth, to my eyes, has always been straight down.

It is remarkable that we never read, except in books of fiction, of ships being struck by lightning. I have been at sea in most violent storms, with lightning darting into the sea every few seconds all around (the water seeming to rise to meet it), and have enjoyed the scene without a thought of danger. I cannot understand this, and suppose ships must be struck sometimes: perhaps their motion is their security.

I understand that in a typhoon or circular storm lightning may be seen flashing in all directions, even upwards: this is not to be wondered at.

I should be most glad if other Selbonians would record what they have *seen* of lightning, and give their explanation of what they have witnessed, so that by a comparison of notes we may

endeavour to get at the truth. I cannot pretend that my part of the above explanation is complete or accurate, but I feel safe in affirming that when there is obstruction to the passage of the electric fluid then violence results. The fluid passes down the copper lightning conductor without doing harm, but the unprotected tower, if struck, suffers much.

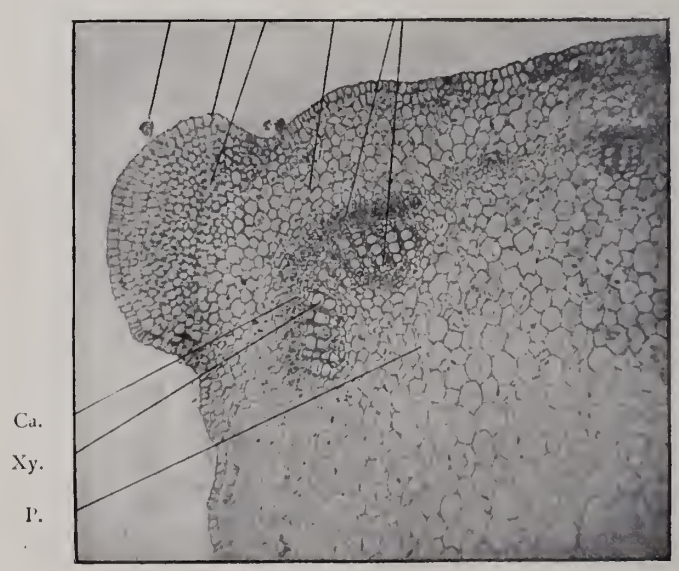
GILES A. DAUBENY.

Gidley, Chagford, Dartmoor, May 29, 1899.

REVIEWS AND EXCHANGES.

Practical Introduction to the Study of Botany: Flowering Plants. By J. Bretland Farmer, M.A., Professor of Botany in the Royal College of Science. Longmans. Price 2s. 6d.

As its title indicates, this is essentially a laboratory guide. The heuristic method of teaching has so pervaded other branches of science, and is so clearly more educational than the dogmatic, that we cannot but be glad that Professor

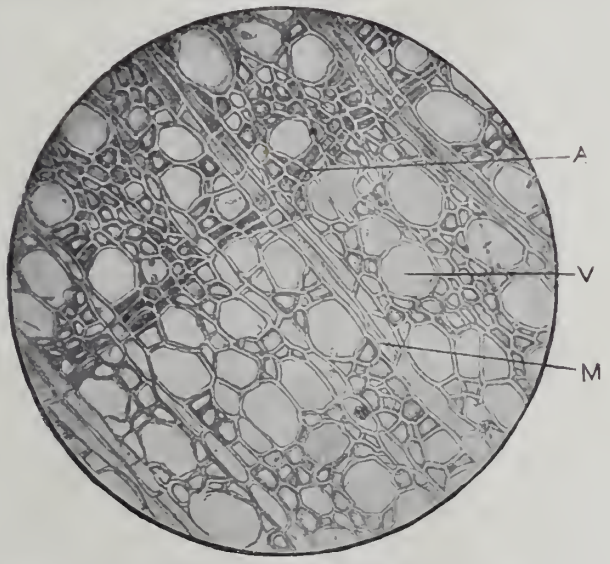


TRANSVERSE SECTION OF THE YOUNG STEM OF DEAD NETTLE.

G., epidermal gland; E., epidermis; Col., collenchyma; C., cortex; Ph., phloem; Pr., protoxylem; Ca., cambium; Xy., xylem; P., pith.

Farmer has given us this handbook to its use in botany. At the same time teachers and all in authority must realise that in so far as this method lays surer foundations it is also far slower. This book is designed for the elementary stage of the Science and Art Department's May examinations, but the work it describes can only adequately be accomplished in a year's course by devoting, we should

think, at least two hours to the subject weekly during thirty weeks. There is the additional serious difficulty that the specimens used in the earlier lessons can only be had in the spring or summer. If the Department truly wishes for an improvement in elementary botanical teaching it must alter the date of its examinations from May to December. An untrammelled teacher need desire no better elementary manual than this; and the illustrations, as may be seen from the two which, by the courtesy of the publishers, we are able to reproduce, are as novel and practical as is the rest of the work.



TRANSVERSE SECTION (HIGHLY MAGNIFIED) OF THE WOOD IN THE STEM OF THE APPLE-TREE.

A., autumn wood of annual ring; V., vessel of the wood; M, medullary ray.

Field and Folklore: An Attempt to help the Beginner in the Studies of our Wild Mammals, Birds, Snails, Trees, Flowers, Grasses, Ferns, Fossils, Flint Implements, and Gothic Architecture; together with Chapters on the Nature Diary, Field and School Rambling Clubs, and a London Park. By Harry Lowerison. With a Chapter on Folk-lore by Alfred Nutt. David Nutt. Price 6d. nett.

It is to be hoped that no one gauges the value of a book by its size, or the importance attached thereto by a reviewer according to the length of his remarks. If we say little about Mr. Lowerison's little book with so lengthy a title-page it is partly because its small price makes us hope that our readers will buy it either for themselves or to give away. It is, in fact, a series of brief papers of advice, written in truly Selbornian spirit, to beginners in almost every branch of Nature-study. They are eminently practical, recommending the best books in each subject, and we almost always agree with the author's selections, as we do also in his defence of the aquarium against his "good friends of the Humanitarian League." With him we relish the London "Clarion" Field Club's announcement, "Rules, nil; Subscription, 1s."; but we are not likely to quarrel with Rule 3 in an alternative set, which runs:—"The —— Field Club will co-operate to the best of its ability with the Royal Society for the Prevention of Cruelty to Animals, the Society for the Protection of Birds, the Commons Preservation Society, the National Footpath Preservation Society, the Selborne Society, the Society for the Protection of Ancient Buildings, the Humanitarian League, and

kindred associations." We have detected a few slips, as where, speaking of Professor George Henslow's "Botany for Beginners," reference is made to "the old man's gentle guidance," presumably meaning that of the author's father; but they are quite insignificant. It is an excellent little book.

The Logic of Vegetarianism: Essays and Dialogues. By Henry S. Salt. Ideal Publishing Union. Price 1s.

If anyone enjoys a vigorously worded and cogently reasoned dialectic, we can—apart altogether from the author's conclusions—heartily recommend them this book. Type, binding and paper leave nothing to be desired.

Handbook of British Breeding Birds. When and Where their Nests are Built: what they are Composed of: the Number and Colour of their Eggs: the Food they Eat: the Nature of their Vocal Powers; and some Local and Old-fashioned Names. By W. Percival-Westell. Henry J. Drane. Price 6d. cloth.

Though the illustrations are not particularly good, this is a useful and handy little compendium, and, being arranged under the alphabetical order of the English names of the birds is far more acceptable than the last of Mr. Percival-Westell's books that we reviewed. For the price, it is, indeed, a remarkable work.

Bird Stuffing and Mounting. With 172 Illustrations and Working Diagrams. By the Authors of "Hints on Egg-Collecting and Nesting." J. & W. Davis, Dartford. Fifth Edition. Price 1s.

We have but little sympathy with the amateur bird-stuffer; but if ornithologists will form private collections this book may no doubt prove useful as a practical handbook. Nothing will, we imagine, take the place of personal teaching in taxidermy. While reading this book we formed an impression that the style of mounting recommended was somewhat artificial and old-fashioned. Certainly the bird-stuffer should study the habits of the living bird, though a visit to the Natural History Museum, or to the collections at Brighton and Christchurch, will do much to show what natural mounting is.

The National Trust for Places of Historic Interest or Natural Beauty. Report for the year 1898-9.

We are glad to see in this fourth annual report a record of steady progress. Mainly on the ground of its scientific interest, the Trust have acquired two acres of Wicken Fen, Cambridgeshire, well known to the botanist and entomologist. Several most desirable acquisitions are prevented by lack of funds. The report is illustrated with views of Eashing Bridge, near Godalming, which dates from the thirteenth century, and of Bow Church, Stratford.

A Beautiful World: The Journal of the Society for Checking the Abuses of Public Advertising. No. 8.

This also is a record of persevering endeavour largely crippled by insufficient funds. The cause is one with which every Selbornian must sympathise.

Report and Transactions of the South-Eastern Union of Scientific Societies for 1899. Taylor & Francis. Price to non-members, 2s.

Wisely determined not to outrun the constable, the Union have issued a smaller volume than that for last year; but its varied contents show that the Rochester meeting was every whit as interesting as any of its predecessors. The organisation of the Union, thanks to the untiring efforts of Dr. Abbott, the Honorary Secretary, is becoming more and more complete, with research committees, referees, photographic section, slide-loan system, &c.; but an increase in the number of affiliated societies, and still more of individual members, is needful to insure stability to this useful but as yet juvenile body.

Received.—On *Hierochloa borealis*, R. & S., as a Scottish Species, by Arthur Bennett, F.L.S., reprinted from *The Annals of Scottish Natural History*; *The Victorian Naturalist* for September; *Science Gossip*, *The Naturalist*, *The Irish Naturalist*, *Humanity*, *The Animals' Friend*, *The Animal World*, *Our Animal Friends*, and *The Agricultural Economist* for October.

NATURAL HISTORY NOTES AND QUERIES.

A Corner of Cheshire.—I have been staying for a time at Leasowe Castle Hydro., a most charming spot situated between the mouths of the Dee and the Mersey. The castle was until lately the property of Sir Charles Cust, Bart., but is now owned by a Syndicate, and used as a delightful health resort. Lady Cust, the wife of Sir Edward Cust, who first bought Leasowe Castle, brought to its old-world gardens many rare plants. I enclose some specimens which I gathered on a waste piece of ground adjoining the estate.

The *Spilanthes oleracea*, which grows freely in the small wet patches, came from Sweden. It is supposed to have been thrown out of the garden and to have found a congenial home in the ditches near. I believe this is the only spot where it grows in England. A rare species of orchis, *Orchis incarnata* is, Dr. Craigmile informs me, to be found here in the spring: there are sea-convolvuli and many vetches, houndstongue, sea-holly, grass of Parnassus and centaury. The flora and fauna of the sandhills are very interesting; of the birds, longshore and inland, I am writing elsewhere. The old gardens of Leasowe Castle are a veritable birds' paradise. The moths again are most interesting: the Belted Beauty (*Nyssia zonaria*), with its wingless mate, is here in March and April. I would urge nature-lovers to try and visit Leasowe.

J. A. Owen Visger.

[The plant sent as *Spilanthes oleracea*, is *Cotula coronopifolia*, L., possibly North American, but occurring in Central Europe, though not in Sweden. It is recorded from this locality in the late Lord de Tabley's "Flora of Cheshire" (p. 176). *Spilanthes oleracea*, sometimes known as Para Cress, is a cultivated species in the tropics, of uncertain origin. Mrs. Visger also enclosed *Gentiana campestris*, L. Lord de Tabley's book contains a most interesting "Physico-botanical Account of Wirral," the peninsula on which Leasowe is situated.—Ed. *N.N.*]

The Great Bat.—These bats are numerous here. I often watch them in their search for prey, and one can hear a cockchafer or other large beetle go click against their jaws when they catch them. The position of the insect in their mouths is changed by their wings as they fly, if it be not held conveniently. They are often to be seen soaring at such a height in the middle of a dull autumn afternoon as to be almost out of sight. On one occasion I was at a cricket match when a squeaking took place in a hollow tree close by, and out flew one of these bats. This was noticed by some ladies and others who were watching the match. As the noise continued it was voted that there was a bats' nest inside, and a gentlemen proceeded to get up the tree in the hope of a find. On this I ventured to suggest that bats do not make nests, and was cross-questioned as to how they managed. It was thought very odd they should carry their young clinging to their bodies instead of leaving them in a nest like birds; and as the squeaking continued my explanation did not satisfy. Again I had to explain by saying, "Wait, and you are sure to see more." And so they did, for presently out the bats poured one after the other, a score at least, and then the squeaking stopped. At last it was agreed there might be something in what I dared to say.

I once caught one of these big bats and brought it home for examination, and beautiful creatures they are. On opening the handkerchief in which it had been placed hundreds of very small and lively parasites ran over my hands and up my sleeves. This finished my curiosity. The bat was liberated at once. My handkerchief was put in hot water and my poor body too. Moral. Look out for bats: they will resent handling in more ways than one!

Market Weston, Thetford, September, 1899. Edmund Thos. Daubeny.

Bramble Finch.—A note of mine on the above subject having been challenged by Mr. Graham Renshaw, I made further inquiries and regret to find that my statement lacks the necessary proof. My informant knew the bramble finch by sight, "and will always think the birds she saw building in the church-

yard were bramble finches," but as, unfortunately, she did not take an egg from the nest, her case falls to the ground.

2, *Blenheim Terrace, Cheltenham.* CONWAY DIGHTON.

Birds Singing at Night.—I have but little doubt but that the bird "Lucy Rowlatt" hears singing at night is the wood lark, which your correspondent, "J. Hiam," does not mention on page 197. The wood lark's song is short and very sweet, and during the late hot dry summer it has sung continuously at night. I have heard the skylark singing after 9 p.m., and the wood lark later still, and then the nightingale, all within a short distance of my house at Pinner, but I have never heard a hedge sparrow do so. ARTHUR N. GILLMAN.

5, *Fellows Road, N.W., October* 6, 1899.

Birds' Beat.—It has often struck me that wild birds have a regular route which they follow day by day in search of food. At the same hour for weeks I have often noted the same bird busily engaged hunting in every hole and cranny in the usual place. As two examples of this methodical means of seeking a living, I will mention that of a kestrel (*Falco tinnunculus*) which for more than three years has often been seen by me sailing over the garden from east to west at midday. And again this September I have noticed a black redstart (*Ruticilla titys*) sitting on a housetop at St. Ulrich, Tyrol, always at about the same hour. Here he sang scraps of song and then went on his way again. It is of course well known how birds adopt a particular spot in which to sing, partly because their nest is near, though this need not draw them to the same twig of a certain tree or bush.

Glenthorne, Eastbourne. E. G. WOODD.

Autumn Appearance of Swallows in London.—I have been not a little interested to observe the visit of swallows and house martins to St. James' Park. I am the more surprised then, not that the date is late in the year, but that throughout the summer I have never seen a single swallow in this particular quarter of London. I first noticed them on September 24 flying over the piece of ornamental water, for the most part keeping to the east side of the bridge. Since then I have not failed to see them daily, their numbers varying from a dozen to about a score or so, and by no means confined to any particular spot. In the afternoon of September 30 I observed three or four hawking round the Savoy Hotel; while high over-head were several sea-gulls, who may be regarded as winter visitants, our spring and winter visitors thus, as it were, overlapping each other. The gulls, by the way, though they had re-appeared on the Thames as far back as September 1, have not yet settled down in the park for their winter quarters. Another day I observed swallows at various points along the Embankment, by the National Liberal Club, the Hotel Cecil, and over the river opposite the Temple. Once I saw a pair even in so central a spot as Gray's Inn. It would be very interesting to know where these swallows have bred during the summer, and what circumstances have induced them to make a temporary sojourn in London before their final departure for warmer regions. If the recent gales have made them delay their departure, why should they select London? Possibly some of your readers may have made similar observations and offer a satisfactory explanation.

I can adduce a parallel experience of the year 1896, when I resided in Kennington. Then, as now, I had failed to see any swallows during the summer; and in that year also, as in this, I was surprised and interested to note their appearance late in September. In the autumn of that year I continued to observe them almost daily for about a fortnight or three weeks on into October. For the most part they preferred Kennington Park, where one day I counted from fifteen to twenty; once or twice I saw them in the Brixton Road, twice nearer the heart of London in the immediate neighbourhood of "The Elephant," once by the trees in front of the model dwellings in Blackfriars Road, and once in so unlikely a place as Fetter Lane. CHAS. J. COLLISON.

16, *North Street, Westminster, S.W., October* 7, 1899.

The Nut-Cracker.—Living in France I have not the opportunity of reading any works of ornithology in English, so will you please tell me the size

and colour of the common nut-cracker (*Nucifraga caryocatactes*) and if it belongs to the Corvidæ. I have always wanted to have a monthly paper on nature, and am very glad to have found out through a friend the existence of NATURE NOTES. D. M.

October 2, 1899.

[William Turner, in his "Avium historia" (1544), gave the name *Nucifraga* to this bird, the "Nousbracher" (now "Nussbrecher") of the Rhætic Alps; Gesner in 1555 called it *Caryocatactes;* in Linnæus it is *Corvus caryocatactes;* and the English name "Nut-cracker" was given by George Edwards in his "Gleanings" in 1758. It undoubtedly belongs to the *Corvidæ*, though once erroneously thought to be allied to the woodpeckers. Its chief food is the seeds of conifers, but it also eats insects, eggs, and small birds. It is about the size of a jackdaw, brown with white spots, chiefly in lines down the neck and breast, and has a rather long straight bill. It is a rare visitant in Britain.—ED. *N.N.*]

Management of Green Tree Frogs in the Winter.—It may be of interest to readers of NATURE NOTES to know that green tree frogs can easily be kept alive all through the winter by the following method, which I have employed for my own specimens during the last five years. The frog is placed in a roomy wide-mouthed bottle, at the bottom of which is a little water to keep the air in the bottle moist. A piece of evergreen serves as a foothold for the frog, and is kept alive for a time by the water, while a cover of stout brown paper or muslin effectually closes the mouth of the bottle. The cover must be perforated to allow the moisture to evaporate, or the whole inside of the bottle will soon be sprouting with mould.

For food, in the autumn the well-known "harvest men" may be used instead of flies, which will be becoming scarce; and in the winter, spiders may be substituted. The spiders will require a systematic search for them in outhouses, under stones, &c., but are an excellent substitute for flies. In the winter my frog, though the bottle is kept on the mantelpiece, is often semi-torpid, and only requires feeding about once a week. The water in the bottle and the piece of evergreen should be changed frequently.

GRAHAM RENSHAW, M.B.

Bees not Swarming.—In reply to Mr. Daubeny, there is no doubt that the very severe cold we experienced late in the spring was the cause of so many colonies not swarming, mine among others. Many stocks died through it, while those fed at the *identical time* gave excellent results. One stock that I sold to a neighbour on July 3, 1898, properly looked after by me and fed, gave a surplus in section honey of about 45lbs. J. HIAM.

Hornet's Instinct or Reason.—A few days ago I had been to a neighbour's to investigate his hives and bees in order to put them secure and well furnished with food to carry them through the coming winter. On my way home a large hornet buzzed past me, no doubt a young queen, on the look out for suitable hybernating quarters. Watching her closely, I saw her settle on the roof of a blacksmith's shop, and after trying several apertures not sufficiently large to admit her she gave up the case as hopeless. Again she tried and examined, as closely as any human being could, the back of an advertisement placard for several minutes, but reappeared and gave it up as hopeless, or unsuitable. She next came buzzing round me as if to ask for advice, and then left to seek other buildings in the locality. I could not help admiring the instinct, or reasoning, or whatever one may call it.

Astwood Bank. J. HIAM.

SELBORNE SOCIETY NOTICES.

Selborne Winter Lectures.—The Council is pleased to announce that a series of lectures during the winter months is being arranged. The first will take place on Tuesday, November 21, at 8.30 p.m., at Morley Hall, 26, George Street, Hanover Square. The subject chosen by the Rev. Professor Henslow, who has kindly consented to give the inaugural lecture, is "Plants and their Surroundings." The chair will be taken by Sir Robert Hunter. Applications

for tickets should be made to the Secretary of the Selborne Society, 20, Hanover Square. The prices at the doors will be 1s., and 2s. for reserved seats. To members applying beforehand by letter, the price of admission will be 6d. A stamped addressed envelope should in each case accompany the application.

Particulars of the other lectures will be given in the December Number of NATURE NOTES.

Selborne Saturday Afternoons.

First meeting, Saturday, November 11, from 2 to 4. To meet at the Natural History Museum. Guide: Professor Boulger.

The Council has appointed a sub-committee, consisting of Mrs. Percy Myles and Mrs. Durrant, to arrange the above.

Council Meetings.—The next meetings of the Council will be on November 7 and 21, at 5.30.

NEWS FROM THE BRANCHES.

Birmingham and Midland.—A very enjoyable walking excursion took place on Saturday, Sept. 16. The party took train to Forge Mills, and thence walked to Coleshill, where the interesting old church, with its noble tower and crocketed spire, was visited. On the way to Yardley, where tea was kindly provided by Mrs. Rowlands, a woodland path, through part of the ancient Forest of Arden, led to Marston Green. The woods as yet showed no sign of autumn —the masses of bracken being in a very green and flourishing condition. There was also a cycling detachment.

FIELD CLUB RAMBLE.

Oxted to Lagham.—*September* 30.—A small party, undaunted by threatening weather, had a most enjoyable ramble for the last of the season, under the guidance of Professor Boulger, or rather of "Walker Miles," since the route described in his little book, recently reviewed in NATURE NOTES, was followed throughout, and with most happy results. It led through beautifully wooded parks and fields rich in early autumn colouring, with a minimum of road, and it was decided at tea that *les absents ont toujours tort.*

ANSWERS TO CORRESPONDENTS.

Miss E. M. Walker.—1. Apparently the Central European *Stachys recta*, L., but not typical, the leaves being remarkably entire and the verticillasters somewhat exceptionally close. 2. *Marrubium peregrinum*, L., sp. (Jacq.), also Central European.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

Nature Notes:
The Selborne Society's Magazine.

No. 120. DECEMBER, 1899. Vol. X.

SELBORNIANA.

Our Future.—With the present number we complete the tenth year of our existence as a Magazine; so, while gratefully mindful of what we have been able to do in the past, we may well consider what lies before the Selborne Society in the immediate future. Firstly, we are not yet out of debt. Secondly, we require many more members in order to carry out our objects effectually. Thirdly, our branches are very imperfectly distributed over the kingdom. Fourthly, the young should be more generally enlisted in our cause, whether by the formation of junior branches or by other means. Fifthly, it is desirable to bring the members—or at least those that can get to London—together more than once a year. It was very discouraging to the Council that the effort which they made in this direction by securing the kind assistance of Professor Henslow, on the 21st ult., was so weakly supported by the members of the Society, very few of whom came to hear the most interesting lecture on "Plants and their Surroundings," which he gave on that evening. Unless more attend at the succeeding lectures of the series the experiment must be abandoned. Sixthly, the Editor would like to see the Magazine enlarged and not altogether dependent for its illustrations, as at present, on the kind liberality of the publishers of works under review. As indicative of the widest conception of our educational scope, our readers will be glad to learn that in our next number Professor Henslow will begin a series of papers on "How Scenery is made."

Illustrations to White's "Selborne."—Mr. Edmund H. New writes:—"In connection with Mr. E. A. Martin's article in your last number, will you kindly allow me to point

out that in the bound volume of the new edition of Gilbert White's 'Natural History of Selborne,' edited by Mr. Grant Allen, the approximate dates of the various views of 'The Wakes,' &c., are given in the 'List of Illustrations?' I should like also to say that, after careful comparison, I believe the panoramic view which I have re-drawn to be a correct representation of Selborne in White's time; but the spot from which the view was taken is now covered with trees, and some of the hedges and trees shown in the engraving have been swept away. The view is of interest as showing the summer-houses on the Hanger, which White seems to describe as the Alcove and the Hermitage. This, and many other drawings, were made by Grimm under Gilbert White's own superintendence, and seem to have given him satisfaction."

A Natural History Diary.—E. O. G. writes:—"Can any member tell me of a good diary with headings for noting down Natural History observations for a child of about ten years old?" As we suppose Dr. Roberts's "Naturalist's Diary" (Swan Sonnenschein) would be thought too advanced, we are at a loss as to any other work of the kind.

The Fashions.—"It was," says the *Daily Graphic*, "satisfactory to note at the Orleans wedding that not a single bird was worn in the hat or bonnet. The ladies attending the function were the *élite* of France, and one and all attired in the extreme 'chic' of the day. Therefore, we may safely conclude that the best foreign, as well as the best Englishwomen, agree in thinking stuffed birds on their heads an atrocity. Neither was there a head of any animal seen on the fur boas."

A Christmas Card.—As a proof of his cordial sympathy with the cause of bird protection, the Poet Laureate, Mr. Alfred Austin, has written a special poem for the Christmas card which the Society for the Protection of Birds is issuing this year. It is entitled "Peace and Goodwill to the Birds," and is illustrated by a charming picture of that much persecuted bird the tern, designed for the purpose by Mr. A. Thorburn.

Killarney.—The Muckross Estate, Killarney, has been purchased by Lord Ardilaun for £60,000. It is said that his lordship has no intention of curtailing the public privileges.

OBSERVATIONS FOR YOUNG BOTANISTS.

XII.—Classification.

WE have now arrived at the last stage of our journey. Having seen how species arise in nature, we must attempt to classify plants. Various systems have been adopted, but as the young student will ere long make use of Sir J. D. Hooker's *Students' Flora of the British Isles*, we cannot do better than follow his arrangement. We will confine our attention to flowering plants, as ferns, mosses, fungi, seaweeds, &c., would require a quite different kind of classification. Hooker's groups are as follows :—

Class I.—**Dicotyledons** or **Exogens.**

Sub-class I.—**Angiospermous Dicotyledons.**

Division I.—**Polypetalæ.**

Sub-division I.—**Thalamifloræ.**
[This contains twenty-one "orders" or "families."]

Sub-division II.—**Calycifloræ.**
[This contains fifteen orders.]

Division II.—**Gamopetalæ.**
[This contains twenty-three orders.]

Division III.—**Incompletæ.**
[This contains thirteen orders.]

Sub-class II.—**Gymnospermous Dicotyledons.**
[This contains one order.]

Class II.—**Monocotyledons** or **Endogens.**
[This contains fifteen orders.]

We must now study these groups somewhat in detail to understand upon what structures they are based. The sequence of the groups of the first sub-class is that of their presumed evolutionary history. Thus the word "polypetalous," though literally signifying "many petals," is used to convey the meaning of *separate petals*, as opposed to "gamopetalous," a term applied to a corolla which has its petals united or coherent. These words supply the names **Polypetalæ** and **Gamopetalæ** respectively.

Sub-division I. is called **Thalamifloræ**, because the parts of the flower arise directly out of the *thalamus*, *i.e.*, the end of the flower-stalk, otherwise called the *floral receptacle*. The freedom of parts is presumed to be a primitive condition, and, therefore, antecedent to *cohesion* between the parts of the several whorls. Entire freedom between the members of all the floral whorls, as in the *Ranunculaceæ*, is comparatively rare. The first instance of

cohesion of frequent occurrence is between the carpels of the pistil. When these are free, as in a buttercup, the pistil is called "apocarpous;" when they are coherent, it becomes "syncarpous," as in a poppy head. It is rarer to find the stamens coherent, but they are so in the mallow. Similarly are the sepals of the calyx sometimes united, as in the mallows and the pinks.

In the second Sub-division, or **Calycifloræ**, the floral receptacle puts on a character which causes the petals and stamens *to appear as if they arose from the calyx;* hence the name. This "receptacular tube" has been already described in the case of members of the rose family. It was at first called the calyx-tube, and is so named in Hooker's "Flora"; but it is better to regard it as an outgrowth of the thalamus. Its use is to secrete honey, and it has probably arisen in response to the irritation of insects themselves.

In the second Division the corolla always has its petals coherent, and represents a more advanced stage in the history of plants than that of the **Polypetalæ**. The corolla may be, and more usually is, "inserted" upon, *i.e.*, rises out of the receptacle; but in some orders of **Calycifloræ**, such as the *Umbelliferæ*, the ovary may be imbedded in a receptacular tube, and then the corolla appears to arise from the summit of the ovary, as in the *Compositæ* and in Campanulas.

It should be also observed that it is a general rule that, when the corolla is "gamopetalous," the stamens are *adherent** to the corolla-tube. The heath family *Ericaceæ* and the *Campanulaceæ* furnish the only exceptions.

Division III. is called **Incompletæ**, because the flowers never have a corolla, and sometimes the calyx is wanting, while the stamens and pistil may be in different flowers. They are believed to be degraded forms, either of orders contained in the preceding divisions, or of which the ancestry is lost.

Sub-class II. is only represented here by one family, which contains the three shrubs or trees, the Scotch fir, the common juniper, and the yew-tree.

They all agree in having no pistil wherewith to protect the ovules. These being therefore quite exposed, have suggested the word *gymnospermous,* or "naked-seeded."

This group is believed to be a very primitive type, and supplies the link between ferns and other "cryptogams" on the one hand, and the flowering or phænogamous plants on the other.

Class II., **Monocotyledons** or **Endogens**, can be best studied in conjuction with Class I., **Dicotyledons** or **Exogens.** The characteristics by which they are known are as follows:—

Dicotyledons — *Embryo* with two cotyledons; *Axial root* present; *Stem* with distinct pith, wood and bark; *Leaves* with netted-veined blades; *Floral whorls* in twos, fours or fives.

* If parts of any one whorl are united, they are said to be *coherent;* if those of two distinct whorls are joined together, they are *adherent.*

Monocotyledons—*Embryo* with one cotyledon; *Axial root* arrested; *Stem* with woody cords isolated; *Leaves* with parallel venation; *Floral whorls* in threes.

A study of these differences reveals the fact that the latter are very often to be found in aquatic plants of the former; and the accumulation of coincidences is so great as to warrant the belief that monocotyledons have descended from such plants occurring among dicotyledonous families.*

To mention a few examples—*The Cotyledon*. Several facts point to an *arrest* of one of two cotyledons in monocotyledons. Thus *asparagus* has a rudimentary cotyledon besides the normal one.

On the other hand, the water-chesnut (*Trapa natans*) and *Ranunculus Ficaria* among dicotyledons have only one.

The axial or tap root is developed in ordinary land plants of dicotyledons, as in the carrot, parsnep, &c.: but it is arrested in the water-crowfoot and in the members of the water-lily family: just as it is in all monocotyledons, or else is very transitory, as is the date.

The stems, as of an oak, compared with that of a palm, show marked differences. The former gave rise to the terms **Exogens**, or "growing on the outside," *i.e.*, of the previous year's wood; the latter, **Endogens**, "growing from within." This, however, rose from a mistaken notion, and is really inapplicable.†

In exogenous, woody stems the woody or fibro-vascular cords are arranged in circles, forming a dense cylinder; but in endogens they are scattered about.

In the flower-stem of a daffodil they will be found quite regularly disposed, while in *Nelumbium* of the *Nymphæaceæ* the circles are separated, and show a tendency to be "dislocated," as in palms.

The parallel venation of the leaf of a monocotyledon is well seen in aquatic plants of this class, for the "ribs" issue out of a collection of isolated cords of the stem, and simply run side by side up the long narrow "leaf." Moreover, if the leaf reach the surface, as in the arrow-head (*Sagittaria*), it then forms a blade at the summit, showing that the linear part is really comparable with a leaf-stalk or petiole, and so might be called a phyllode.

Lastly, numerous monocotyledons are now land plants. They have doubtless arisen from aquatic monocotyledons, as they have retained all the "aquatic features," though now re-adapted to a terrestrial existence.

The above notes are given to show the directions in which

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* A full account of this theory will be found in a paper by the present writer—*Journ. Linn. Soc.*, vol. xxix., p. 485.

† The word is retained as convenient for classificatory purposes; but the *meaning* must be dropped.

the young botanist should look for additional evidence of the above-mentioned theory, and that he may understand that the classification adopted is strictly "natural," in that it follows the evolutionary history of plants.

General Conclusion.—In concluding this series of "Observations," much has, of course, been omitted which might have afforded interest and profit to the young botanist; but if they shall have in any way encouraged him or her to take more notice and to examine plants more accurately than they might have done, the writer's object has been gained.

G. Henslow.

CHRISTMAS GIFT BOOKS.

Gilbert White's house
(From an engraving made soon after his death.)

The Natural History of Selborne. By Gilbert White. Edited, with Notes, by Grant Allen. Illustrated by Edmund H. New. John Lane. Price 21s. nett.

There can be no more suitable Christmas gift for a Selbornian than a new edition of White's Selborne, no matter what editions he may already possess, however little of a bibliophile he or she may be. We are always glad to meet our friends once more. Eulogy of the work itself in these pages and at this time would be impertinent; but, in view of Mr. Grant Allen's statement, in his "Introduction" to this beautiful edition, that "the interest of these Letters is now chiefly literary," it may be permissible to quote the opinion of Professor Alfred Newton from his article "Ornithology" in the *Encyclopædia Britannica*. "This book," he says, "may be safely said to have done more to promote a love of

Ornithology in this country than any other work that has been written, nay, more than all the other works except one [Bewick] put together. . . The severely scientific reader can scarcely find an error in any statement it contains, whether of matter of fact or opinion. It is almost certain that more than half the zoologists of the British Islands for the past seventy years or more have been infected with their love of the study by Gilbert White; and it can hardly be supposed that his influence will cease." Mr. Lane has certainly given us a noble edition of this classic, and one which, considering its wealth of illustrations and the general excellence of its "get up," is by no means dear at a guinea; but the Selbornian is naturally jealous for his hero in every particular. Portrait of White there could not be; but those of Pennant and Daines Barrington are given. An Oliver Twist-like greed regrets the absence of the "Antiquities of Selborne;" and a love of the old-world atmosphere of Selborne, while recognising that the editor's notes are not excessive, somewhat resents the critical modernity of their tone. The most ardent evolutionist does not want the work of Darwin advertised on page after page of White. It becomes almost as tiresome as Warburton's marginalia on Pope. Mr. Grant Allen has not, in fact, caught the atmosphere of Selborne in his text as Mr. New has done in the illustrations. Needless to say, his "Introduction" is charmingly written – few things from his prolific and versatile pen, now for ever laid aside, are not so – but it hardly seems sympathethic and cannot be called an adequate presentment of Gilbert White as a man. Mr. Allen was perhaps too impatient of detail for a biographer. Mr. New gives us Basingstoke Grammar School, where White was as a boy; why not, therefore, also Oriel College, Oxford, where he mostly lived from 1739 to 1752? Failing a picture, we cannot refrain from giving here the following exquisite sketch by Mr. Andrew Lang*:—

"In 1752 Gilbert White of Selborne was Proctor, and may have fined young Gibbon of Magdalen, who little thought that Oxford boasted an official who was to become an English classic. White paid some attention to dress, and got a feather-tipp'd grizzled wig from London; cost him £2 5s. He bought 'mountain wine, very old and good,' and had his crest engraved on his tea-spoons, that everything might be handsome about him. When he treated the Masters of Arts in Oriel Hall they ate a hundred pounds weight of biscuits—not, we trust, without marmalade. 'A bowl of rum-punch from Horsman's' cost half-a-crown. Fancy a jolly Proctor sending out for bowls of rum-punch, and that in April! Eggs cost a penny each, and 'three oranges and a mouse-trap' ninepence. White, a generous man, gave the Vice-Chancellor 'seven pounds of double-refined white sugar.' I like to fancy my learned friend, the Proctor, going to the present Vice-Chancellor's with a donation of white sugar! Manners have certainly changed in the direction of severity. 'Share of the expense for Mr. Butcher's release' came to ten and sixpence. What had Mr. Butcher been doing? The Proctor went 'to Blenheim with Nan,' and it cost him fifteen and sixpence. Perhaps she was one of the 'Oxford Toasts' of a contemporary satire. Strawberries were fourpence a basket on the ninth of June; and on November 6, White lost one shilling 'at cards: in common room.' He went from Selborne to Oxford, 'in a post-chaise with Jenny Croke;' and he gave Jenny a 'round china turene.' Tea cost eight shillings a pound in 1752, while rum-punch was but half-a-crown a bowl. White's highest terminal battels were but £12, though he was a hospitable man, and would readily treat the other Proctor to a bowl of punch. It is well to remember White and Johnson when the Gibbon of that or any other day bewails the intellectual poverty of Oxford."

Each of the many editions of White's "Selborne" has its distinctive peculiarities, most of them some distinctive merit. The present edition is memorable as containing marginalia by Samuel Taylor Coleridge never before printed. The following, on instinct, is characteristic:—"I would rather say, that instinct is the wisdom of the species, not of the individual; but that let any circumstance occur regularly through many generations that then its *every-time-felt* inconvenience would by little and little act through the blind sensations on the organic frame of the animals, till at length they were *born* wise in that

* From "Oxford" (Seeley & Co.), 1896.

respect, and by the same process do they lose their not *in*nate but *con*nate wisdom: thus hens hatched in an artificial oven, as in Egypt, in three or four generations (the same process having been repeated in each) lose the instinct of brooding. I trust that this Note will not be considered as lessening the value of this sweet delightful book.—S. T. Coleridge, *July* 7, 1810, *Keswick*."

By the courtesy of the publisher we are able to use one of Mr. New's most charming illustrations as the frontispiece to our present volume, and also to give an example of the smaller blocks. We congratulate Mr. New on his remarkable success in retaining the character of the old illustrations. There is perhaps some hardness and monotony of line, and the botanist might demand greater characterisation of the foliage of trees other than the horse-chestnut; but if we are critical it is only when we are comparing Mr. New's work to Bewick's.

The Library of Natural History Romance. Vol. 1: *The Romance of Wild Flowers: a Companion to the British Flora.* By Edward Step, F.L.S. Warne & Co.. Price 6s.

This is a really excellent work of its class, a popular introduction to what is termed "the new Botany." It makes no pretence at being in any sense a flora; but calls attention to the various adaptations of flower-structure to fertilisation. The late Mr. Grant Allen was, we fear, responsible for the attempts made by many persons, both readers and writers, to run before they could walk, to grapple with the question why before they had in the least mastered the answer to the question how; so that it is a pleasure to read a work by one of this school at once so accurate and so attractive as is Mr. Step's work. Some of the illustrations from photographs by the author are exquisite.

Sylvia in Flowerland. By Linda Gardiner. With sixteen illustrations by H. E. Butler. Seeley & Co. Price 3s. 6d.

Dedicated, as is this little book, to our President, there is no doubt about its truly Selbornian intent, so that there can equally be no doubt about our sympathy with the writer. We believe that some girls and boys do like stories in which plants and animals do the talking, and will tolerate a thinly-veiled didacticism. There is much dainty punning in the book, reminiscent of Lewis Carroll, as when Sylvia exclaims, "Hairs don't carry boxes on their heads, do they?" and the Nettle replies, "Yes, they do. Boys and girls sometimes get boxes on their ears; why should not plant-hairs have boxes on their heads? If you have hairs on your head, why should we not have heads on our hairs?" Some of the verses and most of H. E. Butler's illustrations are very pretty, as, for instance, "the man at the farm who shoots the owls and the hawks . . . because they kill the rats and mice which he likes to see enjoying themselves in his barns;" but there are several not very little blemishes which we shall hope to see removed in another edition. The artist has missed the effect of conspicuousness which the white campion gains by the overlapping of its petals: "Spruces and monkey-puzzle trees" are, perhaps, a little too previous in the Carboniferous period: the description of the sting of the nettle is inaccurate; and—last, but not least—the Scabious does not belong "to what are called the Composites." Personally, we much object to human beings being spoken of as "humans," but this has become very common of late. The book is daintily got up, and should be popular as a prize in the junior forms of our high schools for girls.

Tommy Smith's Animals. By Edmund Selous. With eight illustrations by G. W. Ord. Methuen & Co. Price 2s. 6d.

Though smaller, cheaper, and intended for boys perhaps rather younger than the little girls who would appreciate "Sylvia in Flowerland," this is a very similar book, designed to eradicate some of that cruelty to animals which seems so innate in the species *Homo sapiens* of the male sex. The narrative, which begins attractively "There was once a little boy, named Tommy Smith," and consists of twelve chapters, each with a rhyming couplet by way of summary, is told with much humour, and reveals much personal study of animals on the

writer's part, whilst the artist has fully entered into the spirit of the book in his slight but capital sketches.

Calendar of Flowering Trees and Shrubs. By Henry Hoare. With illustrations by Miss Gertrude Hamilton. Richard Flint & Co. Price 7s. 6d.

Though we read of a rise in the price of paper, we are struck at every turn by the marvellous cheapness of books which leave little or nothing to be desired in typography or binding. This handsome buckram-bound quarto of about 150 pages, with whole-page chromolithographs of eight species, lists of trees and shrubs arranged according to month of flowering and situation and practical cultural directions, is likely to prove very acceptable to owners of gardens large or small. We are sorry to see the specific names printed with capital initial letters in the text and a considerable number of mis-spellings among them.

OTHER REVIEWS AND EXCHANGES.

Handbook of Plant Collecting. How to Collect, Dry and Mount Plants and Flowers as Botanical Specimens. With illustrations. By J. M. B. Taylor, Curator, Free Museum, Paisley. J. and R. Parlane, Paisley. Price 6d. nett.

This is an altogether excellent and practical guide, unlike any other book known to us in its scope and common sense. Every museum-curator and collector should procure it.

The North American Slime-moulds. By Thomas H. Macbride, A.M., Ph.D. The Macmillan Company. Price 10s. net.

The articles by Sir Edward and Miss Agnes Fry in this year's *Knowledge* and the excellent little threepenny "Guide to the British Mycetozoa exhibited in the Department of Botany, British Museum (Natural History)" by Mr. Arthur Lister, have done much to familiarise English students generally with the variety of interest and beauty afforded by these minute organisms on the borderland between the animal and vegetable kingdoms. What Mr. Lister has done for the group as a whole in his more elaborate "Monograph" (15s.) that Professor Macbride now does for its North American representatives in the present scholarly work, which is enriched by eighteen beautiful plates.

Animal World for November, in addition to its usual interesting contents, has an illustrated article on Nests.

The Animals' Friend for November contains *inter alia* an article by the Editor of NATURE NOTES on the apparent cruelty of Nature.

Received.—*Knowledge*, *Science Gossip*, *The Naturalist*, *The Irish Naturalist*, *Humanity*, *Our Animal Friends*, and *The Agricultural Economist* for November.

NATURAL HISTORY NOTES AND QUERIES.

Birds Singing at Night.—I beg to thank Mr. Gillman for reminding us of the woodlark as a night-singer. I find Gilbert White only mentions three, the nightingale, woodlark, and "less reed-sparrow," no doubt the bird I know as the sedge-warbler. If we may call the note of the corn-crake "singing," of course they keep on most of the night in summer, and who can say they do not enjoy hearing their own voices as much as the nightingales or woodlarks. Woodlarks have become quite extinct in this locality for nearly forty years. About forty-five years ago they were fairly distributed, but from persistent catching, and being so jealous of a rival in the vicinity of their haunts, the catchers with cage-birds from Birmingham in spring cleared the district in the breeding seasons. There was an old German, named Martin, who was the chief cause of it, and I well remember he laid it to the severe winters of 1854 and '5, when the Crimean war was going on. I wish these birds could be once more introduced, but am afraid they would soon be caught up.

Astwood Bank. JAMES HIAM.

Bullfinches and Fruit-Buds.—Mr. James Hiam, in the October number of NATURE NOTES (p. 198), kindly refers to my letter respecting the damage done by birds to fruit-buds. I am astonished to hear that bullfinches have been so plentiful in his part of the country. In our garden and orchard a bullfinch is seldom seen, so that the damage done to our fruit-buds cannot be due to that species. The birds chiefly noticed here are chaffinches, greenfinches, tits, whitethroats, linnets, and sparrows. The bullfinch is, I believe, a rare bird in most districts, and I am inclined to think that he often gets the credit of ravages inflicted in gardens where he does not exist. I shall be glad of any further information with regard to this matter of the fruit-buds from Mr. Hiam or others. Allow me also to say that I cannot approve of the trapping and caging of wild birds under any circumstances whatever; a caged bird is to me a pitiable sight.

October 18, 1899. "VERAX."

Woodpeckers.—Referring to Mr. Odell's article, the woodpeckers will generally frequent fine old trees—upwards of a century's growth—such as are at "The Grove," Stanmore. In many cases the appearance of a fungus upon any tree is shortly followed by a boring by one of the woodpeckers, when the fungus falls off. The most usual trees are:—elm, ash, birch, beech, willow, alder, and white poplar, but I have from time to time noticed holes made in the oak, sycamore, plane, maple, Spanish chesnut, horse chesnut, Lombardy poplar, hornbeam, Scotch fir, silver fir, walnut, mulberry, apple, pear, cherry and holly. *Picus minor* often nests very high up—fifty feet or more. This little bird is not usually observed: its spring cry resembles that of the kestrel.

The great increase of starlings during the last few years, from the enormous foreign arrivals which in many cases stay to breed here, is very trying to the poor green woodpeckers, as their holes are generally pounced upon by the starlings, who watch their opportunity and carry in straws, which at once cause the woodpeckers to withdraw. A recent case in point came to my notice. The female bird, being ejected, laid an egg at the foot of the tree, and in twenty-four hours the male excavated a fresh hole only *three feet from the ground*, and the brood came safely away. The starlings, in their turn, are turned out the following year by bats, with which no bird will live.

The green woodpecker is one of the half-dozen birds which, it is said, never migrate, and their numbers, sadly decimated by the great frost of 1890-91, are now fairly upon the increase, and always, in my opinion, add a peculiar charm to wild nature. W. H. TUCK.

The Goldfinch.—Will you kindly allow me to draw attention to two items of evidence which bear out my contention that the goldfinch is not likely to disappear so soon as some authorities would have us believe? The first is to be found in the recently published "Birds of Breconshire," by Mr. Cambridge Phillips. On page 56 we read of the goldfinch: "Very general all over the county.

We are fortunately not very much troubled with professional bird-catchers, but only by a few amateurs, so that I think this may account for their numbers. I often see them both in large and small flocks, and a pair or so nested in my garden in Brecon nearly every year." The second piece of evidence is to be found in to-day's issue of *The Field* (October 28), where Mr. W. A. Light, writing from Mid-Devon, tells us that in his opinion this species is on the increase in that district. I would also call attention to some useful remarks of Mr. F. Boyes in the same number of *The Field*, in which he very justly urges that the increase and diminution in the number of species is due much more (as I argued in your last number) to the operations of Nature than to the machinations of man. I do not deny that in the case of the goldfinch its popularity as a cage-bird has had some influence on its numbers, but it is as well to remember that this popularity is no new phenomenon of the nineteenth century. If your readers will turn to Willoughby's "Ornithology" (1678), p. 257, they will find that as a captive it was as highly esteemed then as it is now; yet in the space of more than two centuries it has never become extinct. If we may believe those who threaten us with its speedy extinction, it was even very abundant until human nature suddenly became depraved at some uncertain date in the last half-century.

Kingham, Chipping Norton, W. WARDE FOWLER.
October 28, 1899.

In a letter to NATURE NOTES on the subject of the protection of wild birds, Mr. W. Warde Fowler writes as follows:—

"In a recent number of *The Spectator*, Mr. Joseph Collinson stated that not only the goldfinch, but the kingfisher, red-backed shrike and reed-warbler, are also disappearing in numbers. My experience does not tally with this statement in the case of any one of these species."

This is reassuring as far as it goes, but of course it does not cover the whole ground. The exigencies of space at the present moment would scarcely allow of you inserting a compilation of even a tithe of the evidences which I have collected. I may say, however, that many well-known authorities are decidedly of the opinion that the goldfinch is a decreasing bird, and they are agreed that he is in danger of extermination unless more effective measures are devised (and rigorously applied under authority of the police) for his protection.

The following testimony is brief and to the point:—

Mr. W. H. Hudson, one of the most reliable authorities, in a letter to *The Times* of September 26, 1896, says:—"We see that the goldfinch is fast disappearing: fifty years ago it was universal and common."

Mr. Boyd Alexander and Mr. R. Purcell Llewellin have both written to *Land and Water* deploring the decrease of the goldfinch. Says the latter writer:—"For twenty years I have noted the gradual decline in the number of goldfinches and linnets, until it has come to this, that for seven or eight years I have not seen a single wild specimen," and he adds that "there are plenty of observers in the West Midlands who say the same."

According to the *Dundee Advertiser*, the goldfinch has declined enormously in Scotland, and similar stories reach us from Wales and Ireland. So much so is this the case, that the dealers now look to Spain and other continental countries for three-fourths or more of their birds. The late Mr. Grant Allen, Mr. G. Dixon, Mr. James Hiam, the Messrs. Kearton, and the Board of Agriculture, are acceptable authorities, and their testimony is somewhat to the same effect.

My statement concerning the reed-warbler is based on my own observation. I have taken eggs from the nest of this bird in places where now they are almost as rare as those of the great auk. Of the red-backed shrike I know nothing. My authority for stating that it is one of the species known to be annually diminishing in numbers is Mr. Hudson.

With regard to the kingfisher, I have evidence of this species being molested in a wholesale manner, either by the egg collectors or the operations of the bird catchers. Moreover, fishermen and keepers alike are his sworn enemy. I have received information from many reliable sources that the kingfisher is netted and destroyed in a wholesale manner at the fish ponds and hatcheries. This beautiful fellow is certainly still subjected to much senseless and bitter persecution.

53, *Chancery Lane, London.* JOSEPH COLLINSON.
November 15.

Insects and the Atmosphere.—A member writes expressing doubt as to Mr. Coleman's statement (p. 211), that "heavier atmosphere forces insects to lower strata of air," alleging that it is when the air is light that the insects fly low.

Fungi on Water Plants.—Have any of our botanical friends noticed the prevalence of a black fungus, like smut, on various water plants, especially on *Typha latifolia* and *Sparganium ramosum?* It appears to destroy the leaves. I fancy the fungus is a species of *Uredo?*

Cranbrook. A. W. HUDSON.

SELBORNE SOCIETY NOTICES.

Selborne Winter Lectures.—The second lecture will take place at the Royal Zoological Society's room, at 3, Hanover Square, on Friday, December 15, at 8.30 p.m. The subject will be "Wonders and Romance of Insect Life," by Mr. Fred Enoch, F.L.S., F.E.S., illustrated by his own lantern slides. Admission, 1s., or on application to the Secretary beforehand, 6d.; reserved seats, 2s. On Tuesday, January 16, "Man's First Contact with Nature," by Professor G. S. Boulger, F.L.S., F.G.S. The February lecture will, it is hoped, be the one promised some months ago by the Hon. J. Scott Montagu, M.P., on "South African Fauna and Flora," and the March Lecture by Dr. Lubbock.

Selborne Saturday Afternoons:—

Saturday, December 9.—Visit Westminster Abbey. Meet at the Great Cloisters, 2 p.m. *sharp.* Guide, Mr. Stanley Austen.

Saturday, January 13, 1900.—Natural History Museum: Birds; 2 to 4, meet in Central Hall. Guide, Dr. Bowdler Sharpe, F.R.S.

Saturday, February 10.—Lambeth Palace. Further particulars later. Guide, Mr. W. S. Durrant.

Saturday, March 10.—Kew Gardens. Guide, Prof. G. S. Boulger.

Field Club Meetings to recommence in April.

Council Meetings.—The next Council meetings will be held on December 5 and 19.

ANSWERS TO CORRESPONDENTS.

C. S. R.—Fairly typical *Carduus arvensis*, Hoffm.

D. N. D.—So far as I am aware there is no cruelty involved in the slaughter of Astrakhan sheep. "Baby lamb," however, is obtained by unspeakable atrocities.

F. Grant.—Now that "ospreys" have been abolished, I am not aware that any birds are specially slaughtered for the uniforms of the British Army.

NOTICES TO CORRESPONDENTS.

1. All communications for NATURE NOTES must be authenticated with name and address, not necessarily for publication.

2. The return of an unaccepted contribution can only be guaranteed when it is accompanied by a stamped and addressed envelope. We cannot undertake to name specimens privately, to return them, or to reply to questions by letter.

3. All communications for any number must be in the Editor's hands by the 10th of the preceding month.

4. Communications for NATURE NOTES, books for review, specimens for naming, &c., should be addressed to the Editor, PROFESSOR BOULGER, F.L.S., F.G.S., 34, Argyll Mansions, Addison Bridge, London, W.; letters connected with the business of the Society, enquiries as to the supply of the Magazine, subscriptions, &c., to the Secretary, A. J. WESTERN, Esq., 20, Hanover Square, W.

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